THE UNIVERSITY OF ALBERTA

A FOLLOW-UP STUDY OF INDUSTRIAL EDUCATION STUDENTS

by

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled A Follow-up Study of Industrial Education Students submitted by Don Tapscott in partial fulfillment of the requirements for the degree of Master of Education.

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ABSTRACT

The study investigated problems of research methodology and interpretation in follow-up studies of Industrial Education students.

Former Industrial Education students who had studied in Edmonton Public Schools were surveyed approximately eight months after they left the school system. Two subsamples were chosen: (1) those who had completed an Industrial Education program at the 32 level; and (2) those who had completed an Industrial Education program at the 22 level, but who had then left the Edmonton Public School System.

Answers were sought to a number of questions posed by educators about the status of individuals in these two groups after they had left the system. Factors which should be taken into consideration when interpreting data of this kind were discussed. Some general methodological themes which emerge as relevant to Industrial Education follow-up studies throughout the report are summarized.

DEDICATION

To Boyd and Mr. and Mrs. L. Glick

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CHAPTER I

INTRODUCTION

1. The Problem

The need to develop and apply sound methodological tools vis à vis industrial education evaluation has been intensified recently by increased student interest in acquiring marketable technological and trade-related skills. Such interest is at least in part due to high unemployment levels, along with a reported demand for skilled employees, particularly in Alberta. Oram (1978) argues that despite record unemployment, Canadian industry is facing an unprecedented shortage of skilled labor. "In effect", he writes, "it's sitting on a time bomb; a staggering majority of immigrant tradesmen are near retirement age and there's no one to replace them" (p. 3).

Because of this situation, many governments and educators are reviewing industrial education programs. For example, the Edmonton Public School Board has initiated a 1978 study to assess alternate delivery systems for industrial education.

The lack of any ongoing mechanism to track students who have participated in Edmonton Public high school industrial education courses has meant that one dimension of important evaluative data is missing. Lacking complete information on what happens to students once they leave the schools, it is difficult to assess program effectiveness.

This study attempts to ameliorate this problem and to raise a number of considerations of research methodology and data interpretation, through a survey of former Edmonton Public high school students who majored in industrial education courses.

2. Definition of Unique Terms

Industrial Education. For the purposes of this study, Industrial Education refers to the "Industrial Education (Vocational)" program offered in the 12, 22, 32 series in some Edmonton Public Schools. Formerly called Vocational, Technical or Vocational-Technical Education the program consists of 5-20 credit courses which provide in-depth skill development activities ("The Handbook on Industrial Education", 1976).

Industrial Education 32 Graduates (IE32 Graduates). This, for the purposes of this study only, refers to sampled Edmonton Public School students who received marks of 50 or greater, on at least 10 credits of an industrial education course at the 32 level during the 1976-77 school year.

Industrial Education 22 Graduates (IE22 Graduates). For the purposes of this study only, this refers to sampled Edmonton Public School students who received marks of 50 or greater on at least 10 credits of an industrial education course at the 22 level during the 1976-77 school year, but who did not re-enroll in the Edmonton Public School System in the 1977-78 school year.

Employed Full Time. This refers to respondents who are employed 30 or more hours per week and who are not enrolled in an apprenticeship program.

Employed Part Time. This refers to respondents who are employed but less than 30 hours per week and who are neither students nor enrolled in an apprenticeship program.

Present Status. This refers to a respondent's relationship to the means of production, for example "employed", "unemployed", "student", "homemaker". The term does not imply any kind of prestige ranking.

3. Objectives of the Study

As one component of a broader study evaluating industrial education within the Edmonton Public School System, this follow-up survey of former students attempts to answer a number of questions posed by various Edmonton educators. These are:

1. What happens to, or what is the status of former students majoring in Industrial Education, once they leave the Edmonton Public School System?

   Is this status different for students who completed the vocational program compared to those who did not complete the program?

   More specifically:

2. Is the proportion of IE22 Graduates who are unemployed, greater than the proportion of IE32 graduates?
3. Is the length of time to find a job greater for employed IE22 Graduates than for employed IE32 Graduates?
4. Is the mean income for employed IE22 Graduates smaller than for employed IE32 Graduates? Are income distributions different?
5. Is the degree to which jobs are related to high school majors different for employed IE22 Graduates and employed IE32 Graduates?

6. What proportion of IE22 Graduates enter directly into apprenticeship? Does the proportion entering apprenticeship differ for IE22 and IE32 Graduates?
7. Is the degree to which apprenticing trade is related to high school major subject different for IE22 Graduates who are apprenticing and IE32 Graduates who are apprenticing?
8. What proportion of IE32 Graduates are continuing some form of education? Does the type of continuing education differ between IE22 Graduates and IE32 Graduates?
9. What is the relationship between high school major subject and present major subject for those continuing formal education? Is this relationship different for IE22 Graduates and IE32 Graduates?

In general, it is hoped that such data can aide in (1) evaluating the effectiveness of the Industrial Education Program in terms of program objectives, (2) explaining why a relatively large number of students who complete the 22 series leave the Public School System, not enrolling in the 32 series, and (3) assessing the merits, from a student point of view, of completing the 32 series.

Clearly however, the methodology employed to generate these data, and the interpretation made of them will affect the answers to the questions which have been posed. Consequently, the present study focuses on problems of methodology and interpretation in research of this kind.

CHAPTER II

SOME RELEVANT LITERATURE

Some literature relevant to industrial education follow-up studies is summarized here. Three specific topics are examined: (1) Student Follow-up Studies in Alberta; (2) Studies on the Effects of Non-Continuance of Education on Employment Variables; and (3) Methodology in Follow-up Surveys.

1. Student Follow-up Studies in Alberta

Follow-up studies generally investigate individuals who have left an institution after completing a program, treatment or other experience. Such studies help enable the researcher to evaluate what has happened to these individuals, and what impact the experience has had on them. By examining their status and its actual and perceived relationship to their past experience, the investigator can get an idea of the adequacy or inadequacy of the institution and its programs (Best, 1959).

Such studies have particular utility in educational research. Harris (1960) discusses their importance vis à vis vocational education evaluation:

> In general, vocational educators have tended to evaluate their programs in terms of the success of their graduates in the occupations for which they have been prepared. Even this measure has not been used consistently in depth; neither have the findings been reflected in program changes. To know how well the product of the trade and industrial program has fared in the occupational

field would require careful follow-up studies conducted over a period of years (p. 1527).

Relatively few follow-up studies of students have been conducted in Alberta over the past decade. To provide, albeit limited, comparative data and methodology, it is important to review these studies.

Dawson (1966) conducted a follow-up study of former high school shorthand students in Edmonton. After documenting reasons why the students had elected shorthand, he examined the advantages, in terms of income and employment status, of taking shorthand. He found that in general, office employees with shorthand training had higher salaries than those without shorthand training.

Kreutz (1968) examined the realizability of vocational plans of grade 12 students in Alberta through a follow-up survey mailed to a sample of 4,708 persons who had been in grade 12 a year earlier. She found that students in the Vocational-Technical programs realized their vocational plans more often than those in the Matriculation program or the General program. However, students in the Business Education program realized their plans more often than those in all programs. Women realized their plans more often than men. Realizability of plans also varied directly with educational level of fathers and mothers, and several other variables.

Mack (1969) conducted a follow-up study of the 1967 and 1968 graduates of the Edmonton Public School Pre-employment program. Their status was measured using the Vocational-Technical Follow-up Questionnaire, obtained from the Edmonton Public School Board. Mack found that most graduates had obtained jobs, but that in general,

these jobs were not related to the graduates' vocational major. Sixty percent of the respondents had been employed continuously since graduation. Many students had had part time employment while attending school which became full time employment after graduation.

The Edmonton Public School Board (1969) surveyed former vocational-technical students who had left the program the previous year. Table I presents the Current Status of Respondents from this three school follow-up study.

TABLE I

Current Status Of Respondents By School
From The 1969 Edmonton Public School
Vocational Follow-up Survey

Status	School		
	Victoria Composite	Jasper Place	Harry Ainlay
1. Continuing high school	9	45	6
2. Attending a technical institute in a related field	9	8	9
3. Attending a technical institute in an unrelated field	3	1	1
4. Attending university	3	0	0
5. Employed full time in a related field	48	23	15
6. Employed full time in an unrelated field	53	20	32
7. Other	26	6	7
Total	151	103	70

Unfortunately, a lack of information on the sample and response rate makes the data in Table I difficult to interpret or use for comparative purposes. The study concluded that longitudinal data would be more valuable and also that the random sampling technique used did not provide a sufficiently large n to draw conclusions about specific courses in the vocational program.

In another Edmonton Public School Board Study (1970) all first year apprentices enrolled in the automotives, auto body, heavy duty and partsman courses at the Northern Alberta Institute of Technology (N.A.I.T.) were surveyed. It was found that of the 24.5% who had attended high school in Edmonton, 44% had taken automotives as a technical subject in high school; 19.5 percent had taken some other technical course or courses (i.e, woodwork, metals, industrial arts); 36.5 percent had taken no technical courses. Of the 79.5 percent who had attended high schools outside of Edmonton, 11.5 percent had taken automotives in high school; 25.5 percent took some other technical course or courses and a total of 63 percent had taken no technical courses. Pura (1970) compared the employability of Vocational and General high school diploma graduates. From a sample of 40 1968 grade 12 graduates from an Edmonton school he found no significant difference between graduates, in terms of (1) the time required to find the first full time employment, (2) length of time employed, (3) mean income, and (4) the method used to find employment. Significant differences were found between the two groups, with respect to (1) the number of promotions, (2) the relatedness of employment to the high school program studied, and (3) relative job

satisfaction. The vocational graduates scored higher on these three variables.

In a follow-up study of high school graduates and dropouts, Leeck (1971) surveyed former students in the County of Strathcona school system. Students who had written the grade 12 Departmental Examinations in 1963 were sampled. Consequently, respondents had been out of school from three to seven years. Three-quarters of the sample were found to be employed, with the remainder in school, or occupied as homemakers. Unemployment was negligible and of no concern to respondents.

Collin (1971) received a high return rate (66 percent) in a follow-up study of 1966-1970 graduates from the Alberta Vocational and Agricultural Colleges. It was found that nearly 80 percent of the graduates obtained employment immediately following graduation. Over 65 percent of all graduates perceived their first job as being "considerably" and "very much" related to their college program. The author concluded that the colleges are meeting their primary objective of job preparation.

In another follow-up study, Nielsen (1973) divided former high school students who had entered apprenticeship into four groups: (1) students having presented the required high school credentials for full advanced standings; (2) students with fewer than the required credits in either high school or vocational credits; (3) students with some credits in vocational courses but insufficient high school as well as vocational courses for full accreditation; and (4) students without prior vocational training. No significant

differences on various achievement measures were found between the groups with one exception; on one Apprenticeship Board examination students with the required high school and vocational credits for full advanced standings had a mean significantly lower than the mean of students who had presented insufficient high school and insufficient vocational credits. In fact, students with the most high school and vocational credits generally had the lowest achievement score means, where as students with insufficient credits generally had the highest means. The author concluded that high school and vocational credits were poor predictors of success on apprenticeship programs.

Ramsay (1974) mailed an extensive questionnaire to a sample of 238 persons who had reached their second, third or fourth year of apprenticeship but who had withdrawn from the program in either 1968, 1969 or 1970. He found that the proportion of respondents unemployed at the time of withdrawal varied from 15 percent to 31 percent, depending on the trade. Many of these found another job within six weeks. However, 60 percent of the 1969 respondents were unemployed for between seven and twelve weeks. Seventeen percent of electricians were unemployed for 13 weeks or over. Sixty-two percent of all respondents did not, at the time of the study, hold jobs related to the trade in which they were indentured.

In a study examining predictors of academic success at N.A.I.T., Stewart (1974) surveyed a sample of 178 students randomly selected from six programs. Using previous records and survey results he found that variables associated with student aspirations and high school background were the best predictors. A stepwise multiple

regression procedure suggested that nonintellective student characteristics were not strong predictors of academic success.

A recent, as yet unpublished follow-up study reported by Dr. Dave Collett (1978) is of particular relevance and importance. The investigators chose a random sample of 2,754 students who in 1971 were enrolled in grade 12 in schools across Alberta. The students were surveyed, then followed-up in 1973, approximately one year after most had graduated, and then followed-up again in 1977. Survey results were linked to Educational History records. The study examines the current status of subjects over time and also assesses the development and achievement of the educational and occupational plans which the students articulated in 1971.

Among the 1977 findings, the investigators noted that among students who had been enrolled in Vocational, Business, General and Matriculation programs, the former Vocational students reported the highest relatedness of their present jobs to high school studies. A higher proportion of former vocational students were situated in high income brackets, than for other former students. Former vocational education students also reported the highest satisfaction with their career (70 percent). Moreover, former vocational students took the smallest amount of time to find employment. Eighty-four percent found a job within one month of leaving school.

Several conclusions can be drawn from a review of student follow-up studies in Alberta. Although not all studies have been reviewed here, it is clear that the number of such studies which

have been examined, is not great. Longitudinal studies are sparse and no high school or vocational student population has been given repeated cross-sectional examination to check data reliability. Because of different populations, sampling procedures and in particular, non-standardized data collection instruments, comparison of results between studies is difficult.

2. Studies on the Effects of Non-continuance of Education on Employment Variables

A plethora of literature on non-continuance of education, or the so-called "dropout problem" has been produced during the late 1950's and the 1960's. A sign of the times was a series of 1960 CBC radio broadcasts entitled "Stay in School - It Pays to Graduate" (Education Training and Employment, 1961, p. 41). The theme of the broadcasts was that in a world of growing technology, the amount of education one received was directly related to one's potential to find a job, and to the income level one could expect.

With changes in the Canadian economy of the 70's concern about non-continuance of education has waned, or perhaps more accurately, become more complex. The emphasis has shifted from the simple acquisition of education, more to the acquisition of specific skills and abilities. The problem of non-continuance of education has become more a problem of the non-continuance of training.

Because one focus of the present study is the effects of industrial education non-continuance, it is helpful to review pertinent literature on the effects of non-continuance on employment variables.

To begin it should be noted that numerous studies and works have been written on the reasons for non-continuancy of education. Tillery and Kildegaard (1973) review the literature on barriers to continuing education. A less comprehensive review of the "dropout" problem was done by Leeck (1971). Miller (1968) argues that non-continuance of education is a political and social problem, having more to do with unemployment, discrimination and poverty than with the education system. He also argues that "dropouts" may, in fact, be a very heterogeneous group. He suggests that instead of discussing "the dropout" it is necessary to analyse the etiology and experience of different types of dropout (p. 263).

A discussion of the factors related to educational non-continuance is beyond the scope of this study. However, one other important source, of particular relevance to Alberta should be mentioned. Hesteren and Fair (1969) have conducted an extensive study documenting the reasons why some qualified Alberta high school graduates do not continue their education at the post-secondary level, and how such non-continuing students differ from graduates who either continued their education or delayed attendance at a post-secondary institution.

The reasons given by non-continuing students for not attending post-secondary education were, in order of importance, "Was uncertain about future plans", "Didn't think I had the ability to go on", "Wanted to earn own living to be independent of parents", "Not enough money to go on", and "Lack of interest in further education". The investigators also outlined various "personal

factors", "family factors" and "school factors" related to educational non-continuance in Alberta (p. iv-v).

Harvey (1974) notes that very little has been written in Canada about the relationship between education and social mobility. However, more work has been done regarding the effects of education on employment variables. Pertinent studies focusing on (1) income, (2) relatedness of job to high school major, and (3) unemployment are reviewed below, with an emphasis on Alberta research. For a thorough investigation of the relationship between higher education and earnings see Taubman and Wales (1974).

In Alberta, as far back as 1965, many studies comparing the income levels of selected "dropouts" to those who stayed in school, have failed to find significant differences. For example, Vincent (1965) surveyed a group of 154 high school "dropouts" six years after they had withdrawn from Calgary high schools. He noted the mean income was above the national average. However, Scragg (1968) conducted a longtiudinal study of grade 12 students in Alberta through 1963-1968, and found significant differences in income between graduates and students who did not graduate.

The previously mentioned study by Leeck (1971) found that the mean income for Strathcona high school graduates was not statistically different than the mean income of the "dropout" group. The mean income for males was substantially higher than for females and no sex-dropout interaction was found.

Most studies relating educational non-continuance to income note that "job experience" and "time spent in the labor force" are

confounding variables which tend to increase the income level of the "dropout" group. More sophisticated studies have noted complex education-age-sex-race interactions affecting income. For example, Paines and Kohen (1976) performed a longitudinal analysis of National Longitudinal Surveys (NLS) data collected between 1968 and 1971. One finding showed:

> Among high school dropouts, young men in their early twenties enjoy a 12 percent earnings advantage over those in their teens; among high school graduates, the differential is even larger: 16 percent. Such age differentials do not prevail, however, among black men or among either racial group of women (p.67).

There are very few studies which compare job relatedness to educational non-continuancy in Alberta. Sprado (1976) interviewed 17 different corporate respondents representing the manufacturing industries in the Edmonton area. One finding suggests that a high school vocational education is not a factor in hiring policies:

> Vocational high school graduates were not hired for jobs in their particular area of training by 13 firms. Of the few companies which do hire vocational high school graduates in their area of training, the two companies in the wood industries found their training satisfactory. The other two...did not... (p. 57-58).

Such hiring practices may contribute to data derived from former students which suggest that non-continuance of education is not a factor in the relatedness of high school subject to current employment.

There has been more research on the relationship between unemployment and educational non-continuance in Alberta. In general, investigators have found that "dropouts" find employment rapidly and that they constitute a relatively stable layer of employed. Vincent and Black (1966) discuss data collected by Black (1965) in which a sample of 154 Calgary high school "dropouts" were followed-up six years after they had left school. Nearly all were employed in stable job situations. In fact, 80 percent of respondents had taken some form of continuing education. A logical conclusion, unfortunately not drawn by the authors, is that the term "dropout" may be misleading to describe individuals who at a given conjuncture arrest their formal education.

Other studies have shown similar results. Scragg (1968) found equal proportions of high school "dropouts" and graduates who were employed about eight months after the latter had graduated. "Dropouts" had worked significantly more weeks since leaving school than graduates. However, this datum is quite useless, simply because the former had been out of school longer than the latter. In a previously mentioned study by Leeck (1971) three-quarters of both graduates and "dropouts" were found to be employed. However, a dropout-sex interaction was also found. That is, almost identical proportions (76 percent) of the female and male graduates were employed, in contrast to 87 percent of the male "dropouts" and 40 percent of the female "dropouts". One-half of the female "dropouts" were occupied as housewives, compared to 23.8 percent of the female graduates.

Several general points should be made regarding studies on

educational non-continuance and employment in Alberta to date:

1. The "ceiling effect" due to past relatively low levels of unemployment in Alberta has undoubtedly flattened the data, possibly preventing real differences between the employability of graduates and non-graduates from emerging.
2. Confounding variables and interactions have seldom been examined by researchers. Data from more sophisticated studies suggests an important ommission has been made in Alberta. In particular, possible contaminants of sex, age, and length of time since leaving school may have a dramatic, undetected relationship to dependent employment variables.
3. Employment problems faced by youth entering the labor market tend to be mitigated by the passage of time, which as Paines and Kohen (1976) point out brings greater maturity and experience as well as age requirements imposed by employer or law (p. 57). This means it is particularly useful to analyse the early job experiences of young people longitudinally. Doing so, it should be possible to assess (a) how and how much the employability and other variables change over time, and (b) what characteristics are associated with high probabilities of improvement.
4. The wide heterogeneity of "dropouts" coupled with the high proportion of these persons who continue some form of education suggests the term "dropout" may be, at best, of limited value, and possibly quite misleading in the present social context. To begin, it appears most are not "drop

out" at all, but are temporarily arresting formal education. Moreover, the label suggests a certain homogeneity which is questionable. Some "dropouts" maintain immediate, full time, appropriate and satisfying employment; others combine occasional or part time employment with continued training or schooling; others become chronically unemployed. The variation along other variables appears large as well.

5. There have been too few studies to draw clear conclusions regarding the relationship between educational non-continuance and employment variables in Alberta. Non-standardization of populations, survey methodology and data elements make comparisons difficult.

3. Methodology in Follow-up Surveys

Follow-up studies may be viewed as a special subset within survey designs where it is assumed that all respondents have previously passed through a similar situation and are therefore relatively homogeneous on some background variable (Harvey, 1975, p. 4). In educational research, follow-up studies are one technique for studying the changing relationship between education and the labor market, and also serve as an instrument for educational evaluation. Harvey (1975) points out that traditionally, such studies have been based on three research designs: (a) trend design, (b) longitudinal or panel design, and (3) cross sectional design.

The trend design samples different populations at different points in time. For example, 1973 and 1977 industrial education graduates could be follow-up three years after graduation. Trend

studies are primarily useful in describing changes over shorter or longer periods of time and in identifying emerging trends. But the data they produce have only limited value in seeking explanations of change (Glock 1967, p. 51).

In a longitudinal design data from one population is collected at various points in time, usually before and after the specific experience under study, for example, graduation. The Alberta Department of Education (1978) study mentioned previously is an example of a longitudinal design. Such studies provide the most complete data set and according to Wall and Williams (1970) constitute the only method whereby a cause and effect relationship can be depicted accurately. However, problems built into the design include: (a) changes in the hypothesis under study over time may invalidate what has been done previously; and (b) because it is difficult to track the initial respondents sample size and resulting generalizability of findings may be reduced.

The "Basic Survey Design" is the cross-sectional survey. "The earliest and still the most commonly used design in survey research is one which involves the collection of standardized information from or about a sample chosen to represent the component units of a pre-defined universe" (Glock, p. 5). For example, 1978 industrial education graduates in Alberta could be sampled and surveyed in 1979. Data resulting from cross-sectional studies is descriptive showing how various sub-populations are differentiated. While causal relationships may be inferred through this design, they can only be verified by a longitudinal methodology (Harvey, 1976). Cross

sectional studies have the advantage of providing very timely up-to-date data about a population.

Selection of an appropriate design hinges on the objectives of the study, resources available, time-frames, the type of population and other factors. Central problems of survey methodology relevant to the overall design can be grouped into four areas: (a) questionnaire design; (b) sampling procedures; (c) response rate; and (d) data analysis.

a) Questionnaire Design

Sudman and Bradburn (1974) have organized a comprehensive review and synthesis of existing literature on response effects in surveys. The identification and control, or at least moderation of these artifacts is a central objective in questionnaire design. Degree of structure, question length, questionnaire length, problems of threat, self-presentation and saliency of the questions, difficulty, position of various questions, method of administration, and others must be taken carefully into consideration. Sudman and Bradburn's review of the hundreds of methodological studies that demonstrate and discuss various response effects or non-effects is an important acquisition for investigators conducting survey research. Other useful reviews and discussions of the many aspects of questionnaire design are contained in Sudman and Bradburn's extensive, subject-indexed bibliography.

b) Sampling

Sudman (1976) has synthesized material on sampling into a

practical handbook. Classics of sampling theory and practice include Yates' (1960) Sampling Methods for Censuses and Surveys, Cochran's (1963) Sampling Techniques and Raj's (1972) The Design of Sample Surveys.

It is useful to mention literature pertinent to a special problem of sampling in follow-up studies of former industrial education students. That is, in most cases the size of the population (N) from which the sample (n) may be drawn is relatively small. In a given locality, for a given year the number of students majoring in industrial education will be much smaller than, say, the number of householders, the number of students, or the N's in many other surveys. The problem of small N's is compounded by generally small response rates in follow-up surveys, compared to surveys where most respondents' correct addresses are known. The problem is also not unimportant, as noted in the Edmonton Public School Board Survey (1969). Without a substantial number of respondents, the variables "high school major" cannot be adequately introduced into the analysis, because of the usually large number of levels contained in the variable.

The problem of small N's expresses itself concretely when a sample is to be chosen and its generalizability assessed. In many cases it may be necessary to take a 100 percent sample from a given locality or stratum. To make inferences to a larger population it is necessary (a) to introduce the notion of a hyopthetical superpopulation, and (b) to apply caution and

elaborate qualifications when generalizing to this population. The notion of a hypothetical super population has been discussed by Cochran (1963):

> (This) is to regard the finite population as drawn at random from an infinite superpopulation which has certain properties. The result that is proved does not apply to any single finite population (i.e., to any specific set of values Y1, Y2..., YN) but to the average of all finite populations that can be drawn from the infinite population (p. 214-215).

The practical significance of this notion to the present follow-up study will be shown in the discussion of the sampling procedures employed.

c) Response and Non-responses in Follow-up Surveys

Non-response is an important problem in survey research, especially with mailed questionnaires. Yates (1960) argues that unless non-response is confirmed to a small proportion of the whole sample the results cannot claim general validity. However, in the vast majority of surveys there is a substantial non-response rate. Raj (1972), who is one of the most experienced contemporary survey experts writes that "the initial response rate may be barely 40 percent if you are lucky. Repeated reminders may push this rate up to 60 percent" (p. 117).

However, the problem of non-response in follow-up studies, especially of students, tends to be amplified considerably. Harvey (1976), for example writes that former vocational students is a very difficult population to survey:

> They may be characterized as "transient" in one sense of the word. These graduates in many cases do not have roots in their communities. They do not always remain in contact with the school from which they graduated. Many have moved elsewhere in search of employment. Also in some areas they have their telephone disconnected to save money (p. 12-13).

Given these limitations Harvey set a target response rate of 45 percent. After an extensive effort to trace and contact the sample he received a final response rate of 38.2 percent.

Studies comparing characteristics of respondents and non-respondents have generally shown differences. Collett (1978) inferred from late respondents, that non-respondents tend to be lower on ability and achievement-motivation variables. As well, a greater proportion of women responded than men. However, the investigators argued that differences did not appear as vast as some writers have suggested, clearly not so great as to discredit their findings.

Various techniques have been developed to control for non-response. The most desirable is simply to minimize the non-response rate, and treat non-respondents as similar to the remainder of the sample while making appropriate qualifications.

A second procedure is to treat initial non-respondents who responded to a follow-up mailing as a subsample of all initial non-respondents and weight accordingly (Yates, 1960). A variant of this procedure was developed by Raj (1968). He suggests

taking a small subsample of the non-respondents and using all the persuasion, ingenuity and other resources at one's command to get a response from them. The two samples can then be combined and weighted suitably to get a better estimate of the population parameter.

Clearly non-response has an effect on the validity of the data from follow-up studies of vocational students. Harvey (1976) noted that the former Ontario vocational students who participated in this study tended to be: (i) the less geographically mobile segment of the population; (ii) those who had some kind of enduring ties in their community and could therefore be reached through parents and freinds; (iii) those who had found work fairly near the area in which they attended school; and (iv) those in the middle ranges on employment variables, i.e., not the most or least successful, but people who found employment in the town or area where they attended school.

Similarly Reich and Zeigler (1972), in a follow-up study of special vocational high school students in Toronto, argued that a response rate of 59 percent undoubtedly affected data on employment variables. The students who were reached tended to be those who were less mobile and who stayed in school for longer periods of time. As a result the investigators concluded that "the data should be interpreted with some caution..., probably as representing the most favourable estimate of the success experienced by the special students" (p. 13).

In conclusion, the effects of non-response on data must be minimized by either minimizing non-response and/or using appropriate a posteriori statistical controls. In addition, characteristics of non-respondents which can be isolated or inferred must be taken into account when interpreting results.

d) Statistical Analysis

It has been noted earlier that cross-sectional survey designs are usually used to produce descriptive data. Selvin (1957) argues that tests of significance should not be used in non-experimental settings, particularly survey research. Cronbach (1966) writes that tests of significance have been used inappropriately. To him, important differences should be apparent to the eye. The debate over the use of statistical hypothesis testing has been summarized by Tapscott (1977). Winch and Campbell (1969) summarize three basic errors in the use of tests of significance:

i) The interpretation of the significant outcome of a test as proof of a given interpretation of a relationship.

ii) Equating statistical significance with substantive significance, a point recently emphasized by Gold (1969).

iii) The use of wrong error term in "dredging" operations and other multiple comparisons, an issue that has been treated by Selvin (1968) and Ryan (1959). Such procedures often involve hundreds of comparisons and employ error terms that are far too lenient with respect to Type I error (p. 140).

However, Winch and Campbell argue that tests of significance can be useful in quasi-experimental situations, including survey research. The investigator, they write, can test if a variable of classification which in effect orders the data into subsamples produces a mean difference - with respect to a sampling distribution - which is within a given probability. A significant test result eliminates one threat to external validity - instability or fluctuations in the sample.

It was noted earlier that in industrial education follow-up studies, it may be advisable to take a 100 percent sample of those students in a given school, geographical area, etc. The postulation of a hypothetical superpopulation in such cases was mentioned. But, what if the researcher does not plan to generalize findings beyond the immediate population surveyed? Is it legitimate to apply a test of significance when the investigator's data exhaust the specified universe?

Many researchers would reply "No" to this question. In a test of significance one is examining the probablity that an observed difference between subsample parameters may have occurred in a universe where the true difference, or population value, is zero. It would appear that when the entire universe has been exhausted, such inference is not possible. Winch and Campbell (1969) offer a dissenting opinion, arguing that in such cases hypotheses of differences due to chance can be excluded using tests of significance. "The establishment of a statistically significant difference goes one step towards

establishing an interpretation of that difference. That step is to exclude the hypothesis of chance" (p. 143).

CHAPTER III

DESIGN OF THE STUDY

1. The Sample and Population

The sample consisted of 1976-77 Edmonton high school students who have majored in Industrial Education (as defined in Chapter I) and achieved a measure of success in the program. It was not simple to derive precise operational definition of this sample. With the present diversity of courses often taken by an individual student, it is more difficult to separate "industrial education" students from, say "general" or "matriculation" students than in the past. Discussions were held with industrial education Department Heads in the schools, school principals and personnel at the Edmonton Public School Board in an attempt to determine a method of defining and isolating the industrial education student at both the 22 and 32 levels. A somewhat arbitrary, but satisfactory criteria was applied to school records to enable selection of a sample. That is, students who at either the 22 or 32 level had received a passing mark on a minimum of 10 credits of an industrial education course were considered to have been industrial education majors. It was assumed that such students would have completed adequate credits to qualify them as industrial education majors. This assumption was in part validated by the survey results: all respondents listed themselves as having "majored" in an industrial education course.

For reasons of time, resources and an urgent need for follow-up data, a cross-sectional design was chosen in which students were

surveyed approximately eight months after the 1976-77 school year ended. Two subsamples comprised the final sample:

a) Students who in the 1976-77 school year had received marks of 50 or better on 10 credits of an industrial education course at the 32 level. Nearly all of these students had left the Edmonton Public School System at the end of the school year. For the purposes of this study this group has been labelled Industrial Education 32 (IE32) Graduates. It should be noted that they have not necessarily "graduated", i.e., received a high school diploma or matriculation.

b) Students who in the 1976-77 school year had received marks of 50 or better on 10 credits of an industrial education course at the 22 level, but who had withdrawn from the Edmonton Public School System at the end of the school year. For the purposes of this study this group has been labelled Industrial Edcuation 22 (IE22) Graduates. Most of these students had not achieved a high school diploma. The term "graduates" refers solely to their successful completion of 10 credits of an industrial education course at the 22 level.

A two-stage cluster sampling procedure was used in which schools were clusters. Clustering enabled substantial savings in time and costs. During the first stage, three of the six Edmonton composite schools providing an industrial education program, as defined, were selected. Discussions with school and School Board personnel indicated that Jasper Place, Victoria and M.E. LaZerte Composite High Schools would collectively provide the closest

three-school approximation of an industrial education student population. During the second stage of a 100% sample of the 1976-77 IE22 and IE32 Graduates was drawn from these clusters to insure an adequate number of respondents. The sample included 131 IE22 Graduates and 302 IE32 Graduates (total n = 433).

Sample results can be generalized, with some qualifications, to a population of Edmonton students who majored in industrial education. Given geographical differences in unemployment rates, school programs and facilities, rural-urban variation, and other factors, generalizability beyond the city of Edmonton is likely indefensible. Even within that limitation several cautionary notes should be made: (a) changes in the student composition, economic situation, etc. over time may undermine external validity; (b) differences between the Public and Catholic school populations may be undetected; (c) non-response (discussed later) and (d) undetected response effects may affect generalizability.

The actual sample was manually selected from computer printouts of course records for the 1976-77 school year end. The names of students enrolled in industrial education courses were linked across course modules. If a student received passing marks on a minimum of 10 credits at the 32 level in June 1977 she/he was included in the IE32 graduates subsample. If a student received passing marks on a minimum of 10 credits at the 22 level in June 1977, and if the student did not re-enroll in the Edmonton Public School System in September 1977, she/he was included in the IE22 graduates subsample. This somewhat tedious manual operation was necessary because of the

structure of the Edmonton Public School Board computerized records files.

2. The Questionnaire

The questionnaire (Appendix A) was designed by the author to collect data for the 1978 Edmonton Public School Board review of alternate delivery systems for Industrial Education. Data from only one part of this questionnaire is used in the present study. These data deal with the Present Status of the respondents and the perceived relationship of Present Status to High School Major Subject. Data from the rest of the questionnaire is presented and discussed in the final report to the Edmonton Public School Board.

Selection of data elements proceeded through three stages. First, a draft questionnaire was constructed, which took into account (a) data elements from previous Alberta studies, (b) validity and reliability work on measures of occupational attitudes and characteristics (Robinson et. al, 1973), (c) problems of response effects, and (d) standard problems of questionnaire design such as codeability of responses, appropriateness of scales, relationship of data elements to overall questions posed by the study, etc. At a second stage, the draft questionnaire was circulated to School Board and school personnel, and faculty members at the University of Alberta for comments. Finally, it was subjected to a pretest. Five former industrial students were paid five dollars each to complete the questionnaire and then discuss difficulties they had completing it with the researcher. The questionnaire was then revised.

The cluster of data elements dealing with "present status" and "perceived relationship of present status to high school background" required considerable attention. To begin, a variable of mutually exclusive "present status" categories was required. The writer was unable to find a satisfactory variable from the previous studies, so a six level variable was constructed:

a) Apprentice;

b) Unemployed;

c) Employed full time and not apprenticing;

d) Full time student;

e) Employed part time;

f) Housewife.

The variable proved adequate, as most respondents were able to place themselves exclusively at one level.

An additional problem with this cluster of data elements was the development of a physical layout which would enable respondents to check one "present status" level and proceed, unconfused, to answer questions appropriate to that level only. A satisfactory one-page layout was developed which respondents appeared able to understand. (Appendix A, Section C)

Because the questionnaire items are being used for the first time, there is no validity or reliability data on them. Items were, however, constructed with a view to maximizing face validity.

3. Administration

Lacking information on the accuracy of addresses contained in academic history printouts, an attempt was made to verify and update all addresses. Individuals in the sample were phoned; the study was briefly explained to them and addresses confirmed or revised. Twenty-seven of 131 (20.6 percent) of IE22 Graduates had moved or changed telephone numbers. Sixty-one of 302 (20.2 percent) IE32 Graduates had moved or changed telephone numbers. When the original phone number belonged to the individual's parents, in most cases parents supplied an updated address for their child, or agreed to forward the questionnaire.

The questionnaire, explanatory letter (Appendix B) and a stamped self-addressed envelope were mailed to the addresses (which, if possible had been updated). Anonymity was guaranteed to respondents. Identification for follow-up to non-respondents was made with a unique number recorded on each questionnaire. This number was linked to names, for the sole purpose of identifying non-respondents. Individuals' names were not linked to questionnaire data.

The mailing took place February 21, 1978 and respondents were asked to return completed questionnaires within three days. By March 6th, approximately two weeks later, 49.2 percent of the sample had responded. This relatively high initial response rate is likely, in part, due to the pre-phoning which corrected addresses and established personal contact.

Returned envelopes which had been stamped "Moved" or "Unknown" by the post office were sorted according to school. Attempts were

made to track these individuals through contacting teachers in the three schools and through use of the Edmonton telephone directory. Often, teachers had updated addresses or at least the names, or phone numbers of employers or relatives.

On March 10th, a follow-up letter was sent to non-respondents. Three days later all non-respondents were re-contacted by telephone. In some cases, individuals in the sample reported receiving the follow-up letter, but not the original questionnaire. It is not unusual for the Canadian postal service to absorb a certain proportion of survey material. These individuals were re-mailed the questionnaire. By March 31st, the follow-up mailings and phonings had succeeded in boosting response rate to 70 percent for the entire sample. Eighty-one of 131 IE22 Graduates (62.2 percent) and 221 of 302 IE32 Graduates (73.2 percent) responded. Because of the high response rate, it was decided that a statistical correction for non-response could be bypassed, if caution was applied when interpreting the data.

4. Analysis

Completed questionnaires were coded using a manual (Appendix D) and punched onto cards. An SPSS file was generated and basic descriptive statistical data were produced. As explained earlier, cross-sectional studies lend themselves well to descriptive statistics. This study is a good example. Moreover, because of problems of methodology and interpretation inherent in a survey of this kind, it is especially prudent to rely heavily on descriptive data. Rather than formulate statistical hypotheses and "prove" or

"disprove" them using statistical tests, it is more useful to pose some questions which require answers, and then use descriptive information to supplement information on problems of interpretation in attempting to answer these questions. In the best of circumstances null-hypothesis testing cannot carry the entire inferential load. When dealing with the unruly data supplied by an industrial education follow-up survey of this kind, the burden of inductive inference falls even more squarely on the shoulders of the investigator.

The study does not however, rely completely on Bakan's (1966) "interocular traumatic test" (i.e., the correct conclusion will hit you between the eyes). In the spirit of Winch and Campbell's (1969) approach to tests of significance, some simple inferential procedures were employed to assist in assessing the proability that differences in the sample may be due to chance.

Finally, interviews were held with school personnel involved in the industrial education program to solicit ideas on interpretation of survey data. Such discussions proved very useful.

CHAPTER IV

RESULTS

1. Characteristics of the Sample and Respondents

A higher proportion of IE32 Graduates (221 out of 302 = 73.2 percent) returned the completed questionnaire compared to IE32 Graduates (81 out of 131 = 62.6 percent). Also, a higher proportion of women (74 out of 96 = 77 percent) responded compared to men (229 out of 337 = 67.9 percent). Figure I compares the percentage response rates of IE22 and IE32 Graduates by sex. These response rates are:

60 percent of Male IE22 Graduates (57 out of 95);

69 percent of Female IE22 Graduates (25 out of 36);

71 percent of Male IE32 Graduates (172 out of 242);

82 percent of Female IE32 Graduates (49 out of 60).

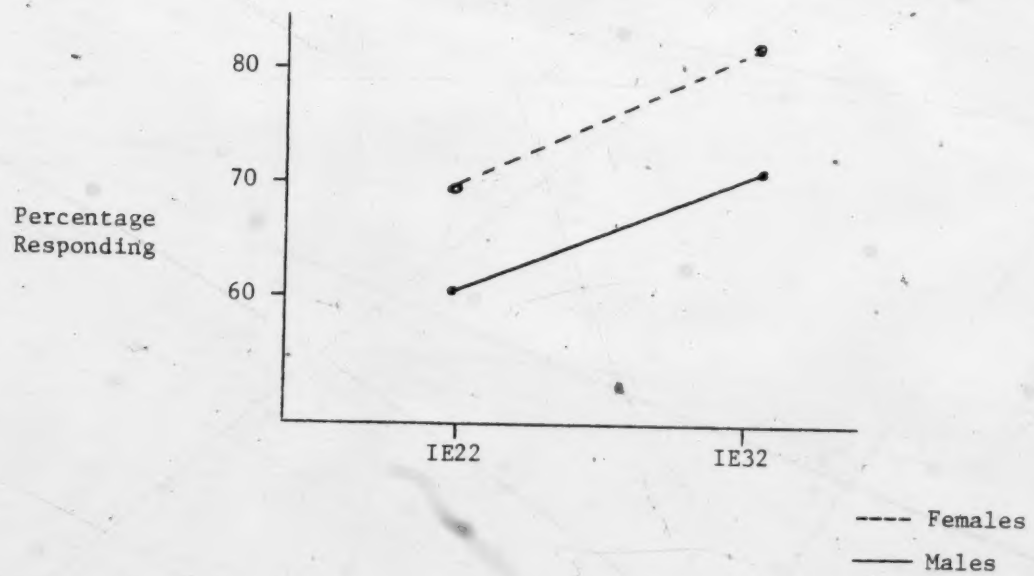

Figure 1. Response Rates of IE22 and IE32 Graduates by Sex; n = 302.

The respondents were young. IE32 Graduates were about a year older (mean age = 18.8) than IE22 Graduates (mean age = 17.9). Standard deviations of age distributions were similar although the standard deviation for IE22 Graduates (1.09) appeared smaller than for IE32 Graduates (1.77). Figure 2 graphs age distributions for the two groups.

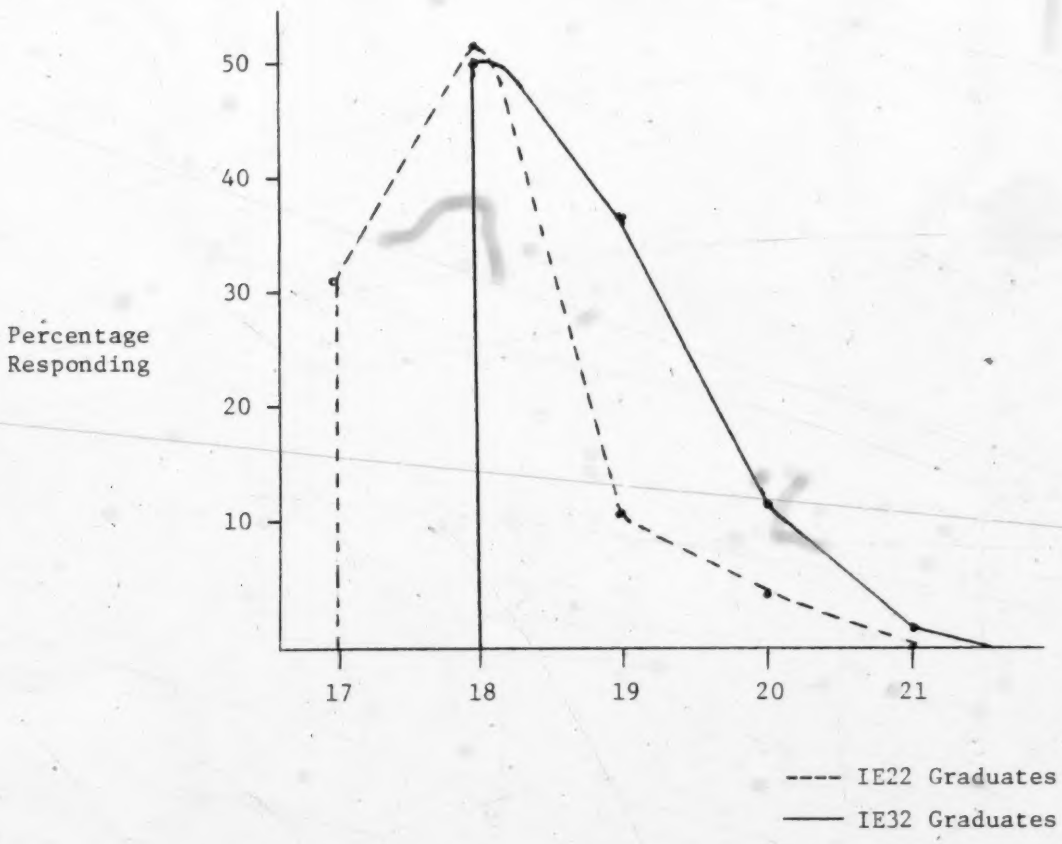

Figure 2. Age Distribution for IE22 and IE32 Graduates; n=302.

Women respondents appeared older than men. The mean age for female IE22 Graduates was 18.4 (SD=1.58) compared to a mean age for male IE22 Graduates of 17.7 (SD=.72). The mean age for female IE32 Graduates was 19.3 (SD=3.5) compared to a mean age for male IE32 Graduates of 18.6 (SD=.70). The larger standard deviations for women reflect the fact that several older women were found in both IE22 and IE32 groups. These women clearly account for some of the age differences found between men and women.

2. Current Status Results

Table 2 presents data on the current status of IE22 and IE32 respondents, and shows a significant difference between present status and program. There appears to be more full time students in the IE22 group, resulting in fewer IE22 Graduates "Apprenticing" and "Employed and not Apprenticing".

Table 2

Present Status of IE22 and IE32 Graduates; n = 303

Present Status	IE22		IE32	
	n	%	n	%
Employed and not apprenticing	28	34.6	102	46.2
Apprenticing	14	17.3	62	28.1
Unemployed	8	9.9	24	10.9
Full-time student	25	30.9	21	9.5
Employed part-time	3	3.7	10	4.5
Part-time student and part-time working	1	1.2	1	.5
Homemaker	1	1.2	1	.5
Total *	81	100	221	100

* Percentage totals inexact due to rounding.

Table 3 presents frequencies for the variable High School Major Subject for IE22 and IE32 Graduates. The category "Other" includes students who majored in drafting and in joint-major combinations of industrial education programs. These are not included in Table 3 because frequencies are small. When the category "Other" was removed and a chi square test performed, no significant difference was found (Chi square = 11.673, df = 11). Consequently, it appears that both IE22 and IE32 Graduates had majored in similar high school subjects.

Table 3

High School Major Subject For
IE22 and IE32 Graduates; n = 303

Subject	IE22		IE32	
	n	%	n	%
Graphic Arts	3	3.7	8	3.6
Commercial Art	10	12.2	18	8.1
Automotives	8	9.8	42	19.0
Auto Body	4	4.9	3	1.4
Building Construction	8	9.8	16	7.2
Machine Shop	2	2.4	16	7.2
Welding	7	8.5	26	11.8
Piping	5	6.1	15	6.8
Electricity	5	6.1	13	5.9
Electronics	7	8.4	13	5.9
Beauty Culture	9	11.0	22	10.0
Food Preparation	6	7.3	18	8.1
Other	8	9.8	11	5.0
Total*	82	100	221	100

* Percentage totals inexact due to rounding.

3. Data on Non-continuance of Education

Table 4 presents frequency data on the perceived relatedness between High School Major Subject and Present Job Type for employed IE22 and IE32 Graduates. It appears, from Table 4 that most employed respondents from both groups were working in jobs which were perceived as being unrelated to their high school major. Seventy-six point eight percent of IE22 Graduates and 70.3 percent of IE32 Graduates were employed in jobs which were "not at all" or only "slightly" related to their high school major.

Table 4

Relationship Between High School Major And Present Job For IE22 and IE32 Graduates Who Are Employed; n=130. Missing cases = 2.

Relationship	IE22		IE 32	
	n	%	n	%
(Very) related	4	14.8	19	18.8
Moderately related	2	7.4	11	10.9
Slightly related	3	11.1	11	10.9
Not at all related	18	66.7	60	59.4
Total	27	100	101	100

It appears that respondents employed part time hold jobs which are unrelated to their high school major subject. All three IE22 Graduates employed part time and nine out of 10 IE32 Graduates employed part time were found to be working in jobs which were "not at all related" to their high school major subject.

Table 5 shows the relationship between High School Major Subject and Apprentice Trade for IE22 and IE32 Graduates who are apprenticing. Most respondents from both groups are enrolled in an apprenticeship program which corresponds to their former high school major subject.

Table 5

Relationship Between High School Major Subject And Apprentice Trade for IE22 and IE32 Graduates Enrolled in Apprenticeship Program; n=78. Missing cases = 2.

Apprentice Trade	IE22		IE32	
	n	%	n	%
Same as high school major	12	85.7	51	82.3
Not the same as high school major	2	14.3	11	17.7
Total	14	100	62	100

Table 6 and Figure 3 depict the Length of Time to Find First Job for those IE22 and IE32 Graduates who were employed.

Table 6

Length of Time in Months to Find First Job For IE22 and IE32 Graduates Who Are Employed; n=130. Missing cases = 6.

Number of Months	IE22		IE32	
	n	%	n	%
1	18	64.3	73	76.0
2	5	17.9	11	11.5
3	2	7.1	4	4.2
4	1	3.6	5	5.2
5	1	3.6	2	2.1
6	0	0	1	1.0
7 or more	1	3.6	0	0
Total*	28	100	96	100

* Percentage totals inexact due to rounding.

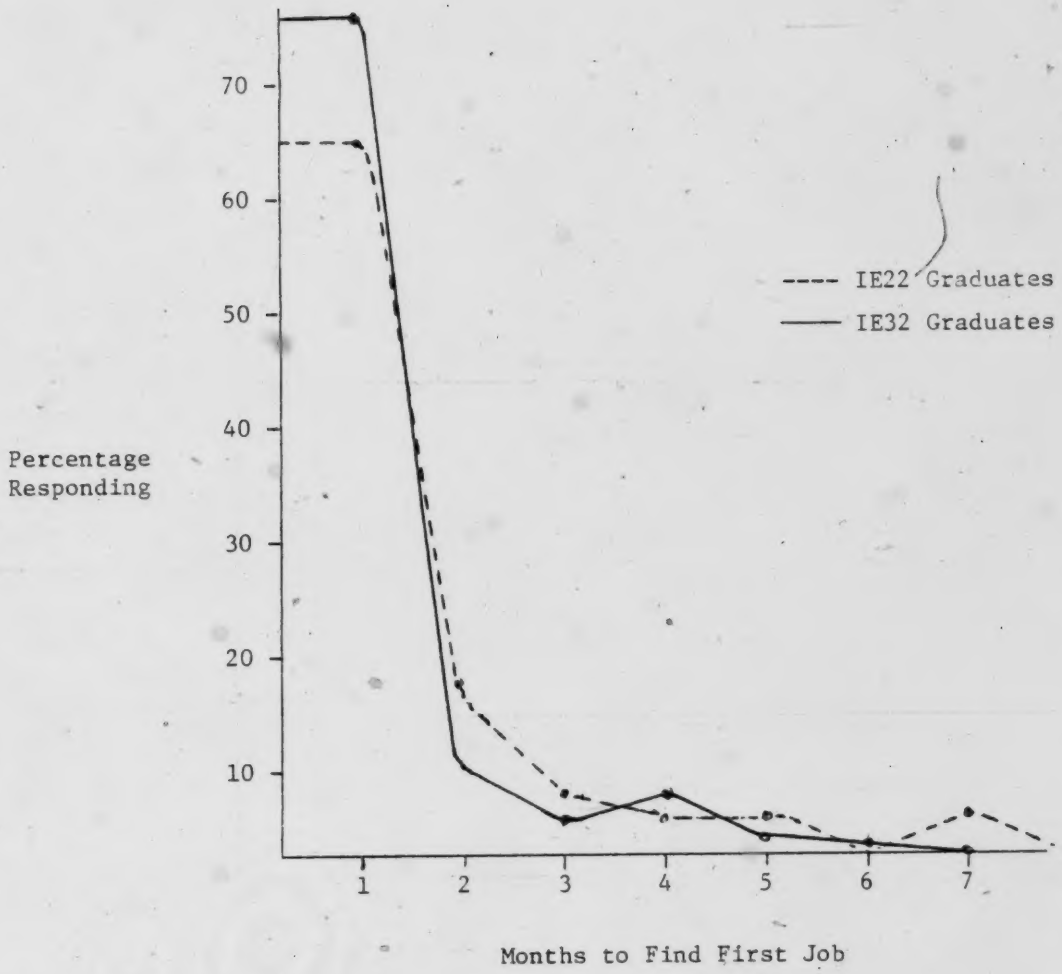

Figure 3. Length of Time in Months to Find First Job for IE22 and IE32 Graduates who are Employed; n=130. Missing cases = 6.

The mean income and the income distributions for the IE22 and IE32 Graduates were very similar. No significant difference in mean income was found. The standard deviation for IE22 Graduates was $4,257 and for the IE32 Graduates, $3,775. Table 7 presents Mean Yearly Incomes and Figure 4 graphs Income Distributions. The uneveness of the IE22 curve is likely attributable simply to the smaller n's involved.

Table 7

Mean Yearly Income for IE22 and IE32 Graduates
Who Are Presently Employed Full Time;
n=130. Missing cases = 27.

	Mean Yearly Income in Dollars
IE22	10,279
IE32	10,071

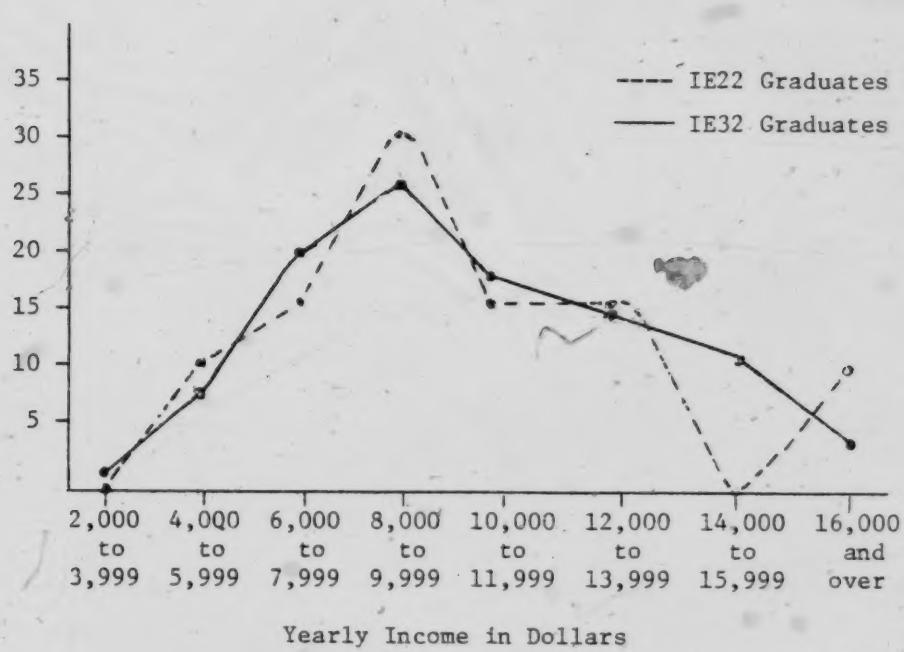

Figure 4. Income Distributions for IE22 and IE32 Graduates; n=130. Missing cases = 29.

The 46 respondents who were students, attended a variety of institutions. These data are presented in Table 8.

Table 8

Educational Institution for IE22 and IE32 Graduates Who Are Students; n=46.

Educational Institution	IE22		IE32	
	n	%	n	%
N.A.I.T.	6	24.0	11	52.4
Community College	2	8.0	3	14.3
Alberta College of Art	0	0	1	4.8
Bible College	2	8.0	1	4.8
University of Alberta	0	0	2	9.5
High School	15	60.0	3	14.3
Total*	25	100	21	100

* Percentage total inexact due to rounding.

It appeared that relatively high proportions of both IE22 and IE32 Graduates who are still students are studying subjects related to their major subject in high school. This is illustrated in Table 9.

Table 9

Relationship Between High School Major Subject And Present Major Subject for IE22 and IE32 Graduates Who Are Students; n=46. Missing cases = 2.

Relationship	IE22		IE32	
	n	%	n	%
The same	16	69.9	9	42.9
Moderately related	1	4.3	3	14.3
Slightly related	2	8.7	5	23.8
Not at all related	4	17.4	4	19.0
Total*	23	100	21	100

* Percentage total inexact due to rounding.

CHAPTER V

DISCUSSION AND CONCLUSIONS

This chapter will discuss some factors which should be taken into consideration when interpreting data of this kind, and also when conducting further research and evaluation in this area. The first part of Chapter V comments on the data presented in Chapter IV. The second part of Chapter V pulls together some general methodological themes which emerge as relevant to industrial education follow-up studies.

1. Interpreting the Survey Results

a) Response Rate

A 70 percent response rate is very good particularly for a study of this type. However, because no statistical corrections have been made to adjust for the characteristics of non-respondents, any available information about this group should be summarized and taken into account when interpreting the results.

As illustrated in Figure 1 higher proportions of women and IE32 Graduates responded to the survey, in comparison to men and IE22 Graduates respectively. The higher response rate for women is consistent with results from other studies, for example the Alberta Department of Education (1978) study. If sex is a confounding variable, its effect will be weighted by the higher response rate for women. For example, if women tend to hold a certain Present Status more than men, the weight of that "Status" in the sample will be greater than in the population, due to the

higher response rate for women.

It is difficult to determine why the response rate was lower for IE22 compared to IE32 Graduates. The proportion of persons in each group who had changed addresses since June 1977 was about the same. This suggests the IE22 group was not more transient or difficult to contact. The explanatory letter mailed with the survey appealed to the sample to assist the School Board evaluate and modify the Industrial Education program. It is possible that IE22 Graduates were less motivated to aid in this endeavor. They had been in school a shorter period of time and possibly had fewer attachments to the program. In addition, the fact that they "dropped out" of the Edmonton Public School System, may reflect a lack of interest or alienation towards the system and any research it has undertaken.

How else does the 30 percent of non-respondents differ from respondents besides having a greater proportion of males and IE22 Graduates? Because no special procedures were undertaken to "sample" non-respondents, it is difficult to answer this question. From previous research we may infer that non-respondents are more likely to be unemployed, employed in jobs less related to high school major subject, having smaller incomes than respondents, and perceive themselves as very less "successful". However, such an inference does not rise much above the level of speculation.

b) Present Status

The first question posed in Chapter I was: 1. What happens to, or what is the status of former

students majoring in Industrial Education, once they leave the Edmonton Public School System?

The results from the Present Status variable presented in Table 2 are quite striking. To begin, 9.5 percent of IE32 Graduates and 30.9 percent of IE22 Graduates are full time students. A more detailed break down of these groups will be discussed later. But it should be noted here that previously mentioned concern about the use of the term "dropout" to describe students, like the IE22 group, who leave the Public School System early, appears justified. Almost one-third of this group is attending an educational institution.

In addition, another 17.3 percent of the IE22 Graduates have entered an apprenticeship program, as did 28.1 percent of IE32 Graduates. The Alberta Department of Education (1978) study found that approximately 15 percent of their sample of former vocational students entered apprenticeship within one year of leaving school. Unfortunately the sample is not quite comparable to either or both of the IE22 and IE32 groups. Whether or not apprenticeship rates of 17.3 and 28.1 percent indicate a successful high school program, involves a highly subjective judgement pointing to the debate over Industrial Education objectives, and to the need for both longitudinal data and comparative data from other programs. These will be discussed later.

The unemployment rates of 9.9 percent (IE22) and 10.9 percent (IE32) are within the norm. The February 1978 Alberta unemployment rate for males and females in the 15-24 age group

was 10.1 percent. This is up from 8.4 percent in 1977 and 7.6 percent in 1966. Again however problems arise in making comparisons. First, the data from this study may well present an underestimation of employment rates, in that previous studies have shown the non-response rate for unemployed persons tends to be higher. Second, Alberta unemployment data is based on Statistics Canada's complicated definiton of employment which includes the notion of "actively seeking work". The number of respondents listing themselves unemployed, who are "actively seeking work" is unknown. Third, the Statistics Canada unemployment rate is based on cross-province data. Differences in the rural-urban unemployment rates may make Edmonton data non-comparable. No Edmonton data was available for 1978 when this report was written.

Comparisons of unemployment data to data from other studies, in particular from other provinces must also be made with care. For example, as previously reported, Harvey (1975) found an unemployment rate of 20.4 percent in an Ontario follow-up of high school graduates. But comparisons to the present study are not possible. First, a difference in the proportion of former students who are unemployed more likely reflects geographical and/or temporal differences in overall unemployment rates than in program effectiveness. Second, a common definition of unemployment is crucial. Harvey had failed to construct Present Status scale of mutually exclusive levels. As a result his category "Unemployed" also includes among others students attending school because they couldn't find a job. Third,

in follow-up studies, the elapsed time between leaving school and the survey date can be a key confounding variable. It is a well known fact that post-graduation or post-departure unemployment is mitigated by time. Those with longer time in the labor market can find employment more easily. The present study was conducted eight months after departure from the Edmonton Public School System. The Harvey study measured students who had left school over a prior five year period.

Occasionally unemployment data from follow-up studies of high school students are reported to be confounded by sex. That is, researchers have chosen to interpret high unemployment rates of female respondents as an artifact produced by women who are really not actively seeking work. However in this study, when unemployment was broken down by Sex it was found that similar proportions of respondents were unemployed (M = 10.1 percent, F = 12.2 percent).

Sex was, however related to Present Status as a whole (Chi square = 39.67, df = 6, sig. = .001). More men (31.6 percent) were apprenticing than women (5.4 percent). More women (56.8 percent) were employed and not apprenticing than men (38.6 percent). Clearly, these findings are linked. Fewer apprenticeship opportunities exist for women. As a result women are more likely to enter directly into this workforce as full time employees. Also, because women are streamed into certain low-skill job types, such as clerical and secretarial work, no further formal training is required. An example from this study is

the fact that two-thirds of all IE22 women who had studied Beauty Culture were employed in a directly related job.

An effort was made to determine if Present Status varied by High School Major. A significant difference was found between expected frequencies and observed frequencies for both IE22 (Chi square = 86.80, df = 60, sig. = .01) and IE32 (Chi square = 80.34, df = 60, sig. = .05) groups. However a visual examination of the data revealed no noteworthy trends. It is possible no clear trends exist. Alternatively, the small frequencies for such a large matrix may be too small to enable visual recognition of real differences.

c) Educational Non-continuance and Unemployment

Chapter I posed this question: 2. Is the proportion of IE22 Graduates who are unemployed greater than the proportion of IE32 Graduates?

Unemployment rates for the two groups appear similar. It would be wrong, however, to conclude that completing the Industrial Education Program has no advantage in terms of finding a job. Setting aside the questions of Job-Type and income level, which will be discussed later, several important methodological problems impede such a conclusions. First, the total proportion of IE32 Graduates who have attempted to enter the labor market (46.2 + 28.1 + 10.9 +4.5 = 89.7 percent) is greater than for IE22 Graduates (34.6 + 17.3 + 9.9 + 3.7 = 65.5 percent). Consequently, a greater proportion of IE32 Graduates were subjected to the possibility of being unemployed. Second, although

unemployment rates for the two groups are similar, a higher proportion of IE32 Graduates have entered an apprenticeship program, which will give them highly marketable skills. Third, the lower response rate for IE22 Graduates may have distorted unemployment data, if trends in previous studies are valid and continuing.

d) Educational Non-continuance and Length of Time to Find a Job

Chapter I posed the question: 3. Is the length of time to find a job greater for employed IE22 Graduates than for employed IE32 Graduates?

Table 6 and Figure 3 indicate that those employed from both groups found jobs relatively quickly. It could be added the mean number of months to find a first job for IE22 Graduates was 1.8 (SD = 1.4) and for IE32 Graduates it was 1.5 (SD = 1.1). However as shown in the Coding Manual (Appendix D) responses of less than one month were coded as "1". The means presented here are therefore artificially large. The Length of Time to Find First Job was broken down by sex and by High School Major Subject. No significant differences were found.

e) Educational Non-continuance and Income

Chapter I posed the question: 4. Is the mean income for employed IE22 Graduates smaller than for IE32 Graduates? Are income distributions different?

From Table 7 and Figure 4 no apparent difference exists. One concern was possible confounding by Sex. Large income differences do exist between employed men (mean income = $11,995) and women

(mean income = $7,526). Sex does not however, interact with the non-continuance variable. Male IE22 Graduates (mean income = $10,279) and male IE32 Graduates (mean income = $11,012) have similar income advantages over Female IE22 Graduates (mean income = $7,287) and Female IE32 Graduates (mean income = $7,614) respectively.

Another possible confounding variable which was examined was High School Major. Again however, a one-way Analysis of Variance showed no significant differences in income levels for either the IE22 or IE32 groups. These are striking findings. They indicate that for students entering the work force directly from school, neither completion of their Industrial Education program, nor the course they majored in is related to the income they can expect to receive eight months later. The significance of this finding, in terms of program objectives will be discussed later.

f) Educational Non-continuance and Relatedness of Job to High School Major

In Chapter I the question was asked: 5. Is the degree to which jobs are related to high school majors different for employed IE22 Graduates and employed IE32 Graduates?

Table 4 indicates the vast majority of employed IE22 (76.8 percent) and IE32 (70.3 percent) Graduates perceived themselves as holding jobs unrelated to their high school major. No significant difference between groups was found. Several factors should be considered when interpreting these data.

First, they are based on a subjective measure. An attempt was made to link Present Job to High School Major Subject. Unfortunately the data for the former variable is clearly invalid. Responses such as "The Bay", "Manager" or "Operator" were difficult to code. This is unfortunate, because the "perceived" Relationship variable relies on non-standardized and highly subjective measures. While it is useful to collect respondents' attitudes, a more objective measure would be an important supplement. For example, a former automotives student who is pr sently driving a truck may perceive his job falling anywhere on the continuum from "not at all related" to "very related".

Second, factors external to the high school major subject may shape data on "relatedness". These include, unemployment rates, changes in the labor market, and the time which has expired between leaving school and when the measurement is taken.

Third, lower non-response rate for IE22 Graduates may have biased results on this variable.

Fourth, the interpretation of these data relies heavily on how one defines the objectives of Industrial Education. If the central function of the IE program is to impact skills to students so that they can market these skills in a related job, then clearly the data indicate extremely modest success. If, on the other hand the objectives of the program centre on providing an opportunity for trade exploration and development of general abilities and attitudes, the data will be evaluated quite differently. One could conclude that 20 to 30 percent of former

students working in a highly related job is a positive biproduct of a very successful program.

g) Educational Non-continuance and Apprenticeship

Chapter I inquired: 6. What proportion of IE22 Graduates enter directly into apprenticeship? Does the proportion entering apprenticeship differ for IE22 and IE32 Graduates? 7. Is the degree to which apprenticing trade is related to High School Major Subject different for IE22 Graduates who are apprenticing and IE32 Graduates who are apprenticing?

Table 2 shows that 17.3 percent of IE22 Graduates and 28.1 percent of IE32 Graduates were enrolled in an apprenticeship program. While the proportion of IE32 Graduates appears higher, it should be noted that the proportion of IE22 Graduates who are apprenticing is quite remarkable. Almost one fifth of these respondents have "dropped out" into an apprenticeship contract. In addition, the fact that over one quarter of IE32 graduates are apprenticing is striking. It is a higher proportion than found in previous Alberta studies, although problems of data-comparability limit the value of such an observation.

It appears that respondents are apprenticing in trades which are highly related to their High School Major Subject (Table 5). No significant difference between expected and observed frequencies for IE22 and IE32 groups was found.

The proportions of former students who apprentice, and the

relatedness of their trade to high school major is also influenced by factors other than the school program. For example, openings in various trade areas and the economic situation are important. Also, entrance into apprenticeship should not be confused with successful completion of apprenticeship. It would be interesting to compare success rates for the IE22 and IE32 respondents. Finally the proportions of those who have entered apprenticeship may be inflated by non-response. Because non-respondents may have different characteristics, these data should likely be considered a maximum estimation of the proportion of individuals who are apprenticing.

h) Educational Non-continuance and Continuing Education

This contradictory subtitle is instructive. Close to one-half (30.9 + 17.3 + 1.2 = 49.4 percent) of those who "dropped-out" of the Edmonton Public School System are continuing their education in other ways (Table 2). In fact a much higher proportion of those who have "dropped out" are continuing formal education compared to those who completed the Industrial Education program. Such a finding was certainly not anticipated.

The explanation for this appears straightforward. Sixty percent of those IE22 Graduates who are students are continuing education at the high school level outside Edmonton or in the Catholic School System. A remaining 24 percent have enrolled in N.A.I.T., taking advantage of the 67 credit admission requirements for some courses (Table 8). On the other hand, half of the IE32 Graduates who are students are enrolled in N.A.I.T.

The remainder are fairly equally distributed across various colleges, high schools and university (Table 8).

It is therefore understandable that student IE22 Graduates are studying subjects which are more directly related to the previous high school major; most of them are still in high school and majoring in the same subject (Table 9). It is also noteworthy that a majority of IE32 Graduates who are continuing their education, are enrolled in programs which are either "The same" or "moderately related" to their high school major (42.9 + 14.3 = 57.2 percent; Table 9).

The higher relatedness of present and previous major subjects suggests that IE students who continue their studies have pursued courses at the high school level which have continued to be of interest and importance to them after leaving the Public School System. In other words, these students appear to decide a career early in high school and follow it up, in terms of continuing education, once they leave. Another implication of these findings is that Industrial Education appears to prepare those who continue their education, at least in providing a background in a given area which students decide to pursue. Of course, this says nothing about post-secondary success rate of these students.

Having made these observations about the results, what general themes of research methodology in Industrial Education follow-up studies emerge?

2. Methodological Conclusions

a) Follow-up Data and Program Evaluation

One theme which is emphasized by this study is the need to relate data from follow-up studies to program objectives. Educators would like answers to questions like: "Is Industrial Education working?" or "What changes should be made?". Follow-up data can help answer such questions only when situated in the context of clearly defined objectives.

Some educators see the function of high school Industrial Education as equipping youth with marketable skills. Clearly, in reference to such an objective the program is of limited value. Most students who enter the labor market directly from school undertake jobs which have little relationship to their High School major, although this may change with time.

Other educators agrue Industrial Education should introduce students to various technologies and trades: it should enable exploration and the development of general abilities which aid students in career selection, in further training in industry or through continuing education, and generally in day to day adult existence. With reference to objectives like these, there are indications from this study that the program is quite successful.

b) The Value of Longitudinal Data

The limitations of a cross-sectional design have been explained throughout this text. Many of the employment data are modified by time. Others are comparable through longitudinal analysis only. For example, data on income levels is most useful

when all respondents have completed their respective apprenticeship programs, post-secondary courses, etc., and when they can be examined in the work force at various junctures. Or, measurement of the proportion of students who enter an apprenticeship program immediately after leaving high school does not tell the whole story about apprenticeship enrollment. But without a longitudinal design, it is not possible to assess entrance to apprenticeship in a rounded manner.

c) The Need for Comparative Data from Other High School Programs

The emphasis on, and resources allocated to various high school programs is continually evaluated by school board. personnel. Follow-up data from former Industrial Education students is inadequate to evaluate an Industrial Education program, even in terms of its own objectives. Data on Job Relatedness, Income, Time to Find First Job, along with career satisfaction and quality of life data is of limited value when restricted to former Industrial Students.

For example, this study found that 70 percent of former Industrial Students who had begun employment held jobs unrelated to their high school major. Does this figure indicate a dismal program, a triumphant program or something in between? Only by comparing the Job Relatedness of former Commercial, General and Matriculation students can a rounded evaluation be made.

d) Comparability of Follow-up Research Data

In the absence of an ongoing tracking mechanism, researchers must rely on individual follow-up studies to provide status and

attitudinal data of fo er students. To this date, the problems in comparing data from various studies are immense. First, a lack of standardization in research design, sampling procedures and data elements makes comparison difficult. A second problem is the variation in Industrial Education programs offered in different localities. A third problem is geographical variation in the economic situation in Canada. Unemployment differences for example between Alberta and Ontario limit comparability. Fourth, comparison of studies conducted at different times is affected by temporal changes in the economy, educational system, etc. Fifth, the amount of time which elapses between the time of separation from the schools and the time of the measurement is important. Unfortunately this time period is different for most Alberta studies.

All of this points to the need for either a tracking mechanism or at least for the initiation of an ongoing cross province longitudinal study.

e) Generalizability

The limitations on external validity of a study like the present one have been discussed. They also point to the need for cross-province research.

f) Sample Size

One of the most important variables in Industrial Education Follow-up studies is High School Major Subject. In order to make appropriate and useful concrete changes in the Industrial Education program, status and attitudinal data should be examined taking the former High School Major Subject into account. Significant

differences between Major Subject groups when measuring dependent employment variables, for example, would be both revealing and important.

Because there are a large number of Major Subjects, the sample size must be great enough to insure adequate cell frequencies for analysis. In general, the n of 221 for the IE32 group was adequate, while the n of 82 for the IE22 group was not. In further studies, response rate should be estimated, the number of levels of the Major Subject variable assessed and a large enough sample selected.

g) Variable Selection and Specification

The Present Status variable used in this study proved adequate. It would be useful to use this variable in future studies.

A more objective measure of the Job Relatedness variable should be developed. This requires the solicitation of valid data on the respondents' present employment. Instead of an open-ended question, a scale could be presented. Alternatively, more precise instructions on how to record one's "Name of Job" could be included on the questionnaire. Or an interview format could circumvent the problem. All of these alternatives unfortunately overlook an important problem with "Relatedness" data. That is, the continual rapid change in occupation types, makes it difficult to monitor the evolving content of various jobs, let alone assess their "relatedness" in comparison to courses studied in high school. Perhaps questionnaire items in this area should focus

on relating specific skills learned in high school, to skills the respondent uses on her/his present job, hobbies or day to day life.

The Length of Time to Find First Job variable should be measured in weeks, not months and include a zero category. Some respondents have a part time job during school and enter employment immediately. Others had found a job while they were in school. In addition, more detailed work history information would be useful. This should include a measure of the "Number of Weeks Worked Since Graduation".

Development of a standardized cross province questionnaire would, again, be useful in this regard.

h) "Non-continuance" of Education

It has been assumed that students who leave the Public School System before entering the IE32 program have "dropped out" or "non-continued" their education. Recent concern on this topic has resulted from a decline in enrollments over the 12-22-32 series. It is already known that one reason for declining enrollments is that some students switch to another program in the school, or simply stop including IE courses in their individual program. Reasons for this are undoubtedly varied; some students take IE courses for interest; others may be satisfied with what they have earned at the 22 level and not enroll in the 32 program; still others may decide Industrial Education is not to their liking, etc.

The present study has shed some additional light on this problem of declining enrollments. Some students who do not "go on" to the 32 level do so because they took the 22 courses when they were in grade 12 and have graduated. Others enter apprenticeship directly from the 22 level. Others enter N.A.I.T. And many are continuing their education in high schools outside Edmonton, the Edmonton Public School System or Alberta. All of this points to the danger of one school board referring to those who leave its jurisdiction as "drop-outs". It also suggests a methodological problem in "drop-out" research. That is, it would be an error to treat those who leave the school system as a homogeneous group, making simple comparisons between these individuals and those who graduate. Most "drop-out" research done in Alberta appears to fall, in varying degrees, into this trap.

i) Hypothesis Testing and Industrial Education Follow-up

The study has attempted to avoid the pitfall of testing, "proving" or "disproving" given scientific and statistical hypotheses and drawing corresponding conclusions which are unjustified. Likely, it has become clear to the reader that because of the complexity of the data and the problems of control in their collection, that a real danger exists here. For example, it is possible to "prove" various hypotheses about differences between the IE22 and IE32 groups but to have, at best, not come any closer to understanding what is involved.

On the other hand, as in any research there is a danger of substituting vague generalities for specific statements about the questions and hypotheses which should be examined.

It is hoped that this study has shed some light on the nature of the Industrial Education student population and on problems of research in this area which will make investigation of more specific questions and hypotheses possible.

j) Further Research

The study has developed a number of implications for further research and has also discussed the need for cross-province, longitudinal studies which follow-up students from all high school programs. In addition to these a number of suggestions could be made:

1. There is a need to measure the validity and reliability of data collection instruments such as the one designed for this study. In particular, determination of the validity of the Present Status item is important. Construct validity could be measured by correlating the reported Present Status of a subsample of respondents with their real status verified through Apprenticeship Board, High School, NAIT, etc. records.
2. Further work on the question of Job Relatedness is necessary. Several ways of obtaining more objective measures have been suggested. In addiiton, further studies should collect information on how skills learned in high school are useful in present hobbies, interests and day-to-day living in general.

3. Studies which collect data on former students from all high school programs should look for sex cofounding in data from Industrial Education students. Because the ratio of males to females is different for the IE students, important sex differences may be affecting data on a number of variables.
4. A useful project would be to compare "Length of Time To Find a Job", "Income" and "Job Relatedness" to measures of Job Search Skills, and to academic background. What role do specific job search abilities have in finding a job, finding a related job and finding a good paying job? How do such skills interact with the former student's high school major subject?
5. Little is known about sample selection and follow-up data in Alberta. It would be useful to examine to what extent "Present Status" is a function of the schools selected for the sample. Perhaps school size, facilities, teacher variables, proportion of IE students in a school, etc., are related to what happens to an IE student after leaving the school system.

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APPENDIX A

QUESTIONNAIRE

EDMONTON PUBLIC SCHOOL BOARD

VOCATIONAL EDUCATION QUESTIONNAIRE

Do NOT write your name.

For each question, make an X in the appropriate space provided.

Section A

1. What high school did you attend in the 1976-77 school year?

- ☐ a) Jasper Place
- ☐ b) M.E. LaZerte
- ☐ c) Victoria Composite

2. What subject was your Major in the 1976-77 school year?

- ☐ a) Drafting
- ☐ b) Graphic Arts
- ☐ c) Commercial Art
- ☐ d) Automotives
- ☐ e) Aircraft Maintenance
- ☐ f) Auto Body
- ☐ g) Appliance Servicing
- ☐ h) Building Construction
- ☐ i) Machine Shop
- ☐ j) Welding
- ☐ k) Piping
- ☐ l) Sheet Metal
- ☐ m) Electricity
- ☐ n) Electronics
- ☐ o) Beauty Culture
- ☐ p) Fashions and Furnishings
- ☐ q) Food Preparation
- ☐ r) Health Services
- ☐ s) Performing Arts
- ☐ t) T.V. Crafts
- ☐ u) Horticulture
- ☐ v) None of the above (specify) _____

Section B

How much do you agree with the following statements? Circle the appropriate number.

	Agree Strongly		Neutral		Disagree Strongly
1. I majored in this subject to get training leading to a job.	1	2	3	4	5
2. I majored in this subject because I found it the most interesting.	1	2	3	4	5
3. I majored in this subject because some of my friends did.	1	2	3	4	5
4. I had decided which subject I wanted to major in before I came to high school.	1	2	3	4	5
5. My parents disapprove of my choice of major.	1	2	3	4	5
6. My parents think I should have taken an Academic rather than a Vocational program.	1	2	3	4	5
7. I took the Vocational rather than the Academic program because my parents wanted me to.	1	2	3	4	5
8. I took the Vocational rather than the Academic program because some of my friends did.	1	2	3	4	5
9. I took the Vocational rather than the Academic program because I found it more interesting.	1	2	3	4	5
10. I took the Vocational rather than the Academic program because I wanted to get training leading to a job.	1	2	3	4	5
11. Parents, in general, urge their children to follow an academic program, even if it does not suit the students interests and attitudes.	1	2	3	4	5
12. Low prestige or respect for the Vocational program discourages many students from enrolling in Vocational subjects.	1	2	3	4	5
13. Students who graduate from the Vocational program have a better chance of getting a high paying job than students who graduate from the academic program.	1	2	3	4	5

Section C

Present Status. Place an X in one of the boxes on the left below (Numbers 1-7), and and answer the corresponding questions.

☐ 1. APPRENTICE
(If checked, answer) →
a) Are you apprenticing in the same trade as your high school major?
☐ i) Yes ☐ ii) No
b) Name of trade: _____

☐ 2. UNEMPLOYED
(If checked, answer) →
a) Have you worked since leaving school? ☐ i) Yes ☐ ii) No
b) If yes, was your longest job related to your school major?
☐ i) Yes ☐ iii) Slightly related
☐ ii) Moderately related ☐ iv) Not at all related

☐ 3. EMPLOYED FULL TIME
AND NOT APPRENTICING
(30/hr/week or more)
(If checked, answer) →
a) Name of job: _____
b) Is your present job related to your high school major?
☐ i) Yes ☐ iii) Slightly related
☐ ii) Moderately related ☐ iv) Not at all related
c) How long, from the time you left high school, did it take you to find your FIRST job? (Number of months) _____
d) How long, from the time you left high school, did it take you to find your PRESENT job. (Number of months) _____
e) Yearly income: _____

☐ 4. FULL TIME STUDENT
(If checked, answer) →
a) Check one
☐ i) NAIT
☐ ii) Community college (which? _____)
☐ iii) High school (which? _____)
☐ iv) Provincial (Agricultural) College (which? _____)
☐ v) Other (specify _____)
b) What is your present major (program)? _____ major subject
c) Is your present major related to your previous high school major?
☐ i) Yes ☐ iii) Slightly related
☐ ii) Moderately related ☐ iv) Not at all related

☐ 5. EMPLOYED PART TIME
(less than 30 hrs/wk and neither student or apprentice)
If checked, answer) →
a) Name of Job: _____
b) Is your present job related to your high school major?
☐ i) Yes ☐ iii) Slightly related
☐ ii) Moderately related ☐ iv) Not at all related
c) Would you like a full time job? ☐ i) Yes ☐ ii) No

☐ 6. HOUSEWIFE

☐ 7. NONE OF THE ABOVE
(If checked, what is your present status? _____)

Section D

How much do you agree with the following statements?

	Agree Strongly		Neutral		Disagree Strongly
1. The career counseling at my school helped me find a career.	1	2	3	4	5
2. If I could start high school all over again I would take a different major.	1	2	3	4	5
3. If I could start high school all over again I would register in the Academic program.	1	2	3	4	5
4. Most students receive very little information about the various high school programs and courses available.	1	2	3	4	5
5. My high school training will (or has) help(ed) me get a job.	1	2	3	4	5

6. If you were still in school, which of these people would you now ask for help in deciding a career? Check ONE only.

- ☐ a) Friends
- ☐ b) Teacher
- ☐ c) Parents
- ☐ d) Guidance Counselor
- ☐ e) Assistant Principal
- ☐ f) Other (specify) _____

7. Have you chosen a career?

- ☐ a) Yes
- ☐ b) No

8. Is this career directly related to your school major?

- ☐ a) Yes
- ☐ b) No
- ☐ c) Cannot say. I have not chosen a career.

9. Do you plan to get your high school diploma?

- ☐ a) Yes
- ☐ b) No

10. Taking all things together, how would you say things are these days? Would you say you are:

- ☐ a) Very happy
- ☐ b) Pretty happy
- ☐ c) Not too happy

11. In general, how satisfying do you find the way you're spending your life these days? Would you call it:

- ☐ a) Completely satisfying
- ☐ b) Pretty satisfying
- ☐ c) Not very satisfying

Section E

The questions in Section E relate to two kinds of vocational education. These are:

Industrial Education (General) courses in the 10, 20, 30 series are offered for five credits in some schools and were formerly called Industrial Arts. There is no indepth skill development.

Industrial Education (Vocational) in the 12-22-32 series are offered for 5 - 20 credits in some schools and were formerly called Vocational, Technical or Vocational-Technical Education. These courses attempt to provide indepth skill development.

1. If you had had a choice of registering for either program at your home school which one would you choose?

- ☐ a) Industrial Education (General)
- ☐ b) Industrial Education (Vocational)
- ☐ c) Don't know

2. I have taken one or more Industrial Education (General) courses.

☐ a) Yes
☐ b) No

If you answered NO, skip questions #3 to #11, and begin again with question #12.

If you answered YES, how much do you agree with the following statements?

	Agree Strongly		Neutral		Disagree Strongly
3. Most students find Industrial Education (General) courses more interesting than Industrial Education (Vocational) courses.	1	2	3	4	5
4. Industrial Education (General) courses help students become aware of the interrelationship of one technology upon the other.	1	2	3	4	5
5. Most Industrial Education (General) courses are a waste of time.	1	2	3	4	5
6. Industrial Education (General) courses provide guidance to students to help them select more indepth, skill-development courses.	1	2	3	4	5
7. Most students find Industrial Education (General) courses more challenging than Industrial Education (Vocational) courses.	1	2	3	4	5
8. Many students discontinue Industrial Education (General) courses because they are not learning specific skills.	1	2	3	4	5
9. I took an Industrial Education (General) course as an elective, because I needed an additional 5 credit course.	1	2	3	4	5
10. It would be better to discontinue all Industrial Education (General) courses and put more resources into the Industrial Education (Vocational) program.	1	2	3	4	5
11. It would be better to discontinue 20-30 level Industrial Education (General) courese and put more resources into the Industrial Education (Vocational) program.	1	2	3	4	5

12. Many students discontinue the Industrial Education (General) program and switch into another program. Why do you think this is the case?

_____

_____

_____

13. How many miles did you live from the school you attended last year (1976-77)?

_____ Number of miles (If less than 1 record 1.)

14. How many minutes did it take you to get to school?

_____ Number of minutes

15. If your major had not been offered at this school, would you have transfered to another school?

- ☐ a) Yes
- ☐ b) No
- ☐ c) Don't know
- ☐ d) I would have quit school

16. If your major had not been offered at this school, would you have switched major's?

- ☐ a) Yes
- ☐ b) No
- ☐ c) Don't know
- ☐ d) I would have quit school.

Section F

1. Are you

- ☐ a) Male
- ☐ b) Female

2. How old are you? _____ (Age)

3. How many brothers and sisters do you have? _____ (Number)

4. What is your marital status?

- ☐ a) Single
- ☐ b) Married
- ☐ c) Separated
- ☐ d) Divorced
- ☐ e) Widowed

5. What is your father's last occupation? _____
(If deceased or retired, indicate last occupation also.)

6. What is your mother's last occupation? _____
(If deceased or retired, indicate last occupation also.)

7. What is the approximate combined income of both your parents?

_____ per year ☐ Don't know

8. Do you live at the home of your parents or other relative?

☐ a) Yes
☐ b) No

9. What city (town, etc.) do you live in?

_____

10. How far do you live from the school where you received most of your high school education?

☐ a) 0-10 miles
☐ b) 10-50 miles
☐ c) 50-100 miles
☐ d) 100-200 miles
☐ e) over 200 miles

11. How long have your parents lived in Canada?

☐ a) All their lives
☐ b) _____ years (Mother)
_____ years (Father)

12. Do either of your parents speak another language at home?

☐ a) Yes (specify) _____
☐ b) No

Section G

Why did you not take the Vocational 32 Series at your school after you had completed the Vocational 22 Series there. Place an X in one of the boxes to the left below, and answer the corresponding questions, if any.

☐ 1. Got a full time job. (If checked, answer) →
- a) Name of Job: _____
- b) Was this job related to your high school major?
  - ☐ i) Yes
  - ☐ ii) Moderately related
  - ☐ iii) Slightly related
  - ☐ iv) Not at all related
- c) Why did you decide to work full time? _____

☐ 2. Decided to look for full-time work. (If checked, answer) →
- a) Why did you decide to look for full time work? _____

☐ 3. Switched to the General Program (If checked, answer) →
- a) Are you presently enrolled in the General Program? ☐ i) Yes ☐ ii) No
- b) Why did you enroll in the General Program?
  - ☐ i) To get Grade 12
  - ☐ ii) Other (specify) _____

☐ 4. Changed High Schools and am taking the Vocational 32 Series there.
☐ 5. Entered Apprenticeship
☐ 6. Enrolled in NAIT, Community College, or Provincial (Agricultural) College
☐ 7. Tired of school.
☐ 8. Marks not good enough to continue
☐ 9. Other (specify) _____

Section F: Comments

Please make any additional comments you have on the vocational education program and how you think it should be changed.

THANK YOU VERY MUCH FOR YOUR HELP. PLEASE PUT THE COMPLETED QUESTIONNAIRE IN THE SELF-ADDRESSED STAMPED ENVELOPE AND MAIL RIGHT AWAY.

20/2/78

Section G: Comments

Please make any additional comments you have on the vocational education program and how you think it should be changed.

THANK YOU VERY MUCH FOR YOUR HELP. PLEASE PUT THE COMPLETED QUESTIONNAIRE IN THE SELF-ADDRESSED STAMPED ENVELOPE AND MAIL RIGHT AWAY.

20/2/78

APPENDIX B

LETTER TO SAMPLE

EDMONTON PUBLIC SCHOOLS

87.

10010 - 107A Avenue, Edmonton, Alberta, T5H [illegible]

BOARD OF TRUSTEES

Mrs. Shirley Hayes
Chairman

Mr. Don Bailey

Mr. James F. Falconer

Mrs. Catherine Ford

Mr. R. Hetherington

Mrs. Clare Jones

Mr. F. Lund

Dr. Donald Massey

Mr. Jim Patrick

ADMINISTRATION

Mr. M. A. Strembitsky
Superintendent
Secretary-Treasurer

Mr. G. P. Nicholson
Associate Superintendent
Operations

Mr. R. A. Jones
Deputy Secretary

Mr. D. A. McGeachy
Deputy Treasurer

February 21, 1978

The Edmonton Public School Board has undertaken a review of the Vocational Education program. We want to know what students think about the program and how it can be changed to provide a more useful, meaningful education.

To do this, we are conducting a survey. You have been randomly chosen from a list of people who were enrolled in a Vocational Education course during the 1976-77 year to take part in the survey. We would like you to answer the enclosed questionnaire. It should only take you a few minutes to complete.

Please do not write your name on the questionnaire. We want to make sure answers are anonymous. Each questionnaire has a number in the top corner. This will be used to make sure we get all the questionnaires back, but it will not link your name to the answers you give. So you can feel free to answer frankly.

We need to receive the completed questionnaire as soon as possible, so we can complete the survey and make the required changes in the program to benefit next term's students.

So, when you have completed the questionnaire, please mail it back to us in the enclosed stamped, self-addressed envelope, if possible, within the next three days.

Your opinion counts and we sincerely appreciate your help. Thank you very much and I hope to hear from you very soon.

Yours truly,

Wes Penner, Ph.D.
Director of Evaluation

WJP/ja

VERY SAMPLE LETTERHEAD

APPENDIX C

FOLLOW-UP LETTER

EDMONTON PUBLIC SCHOOLS 89.

10010 - 107A Avenue, Edmonton, Alberta T5H 0Z8 Telephone

BOARD OF TRUSTEES

Mr. [illegible]
Chairman

Mr. [illegible]

Mr. [illegible]

Mrs. Catherine Ford

Mr. R. Herbert Jamieson

Mrs. [illegible]

Mr. [illegible]

Dr. Donald Massey

Mr. Jim Patrick

ADMINISTRATION

Mr. M. A. Stremmler
Superintendent
Secretary-Treasurer

Mr. G. P. Nicholson
Associate Superintendent
Operations

Mr. R. A. Jones
Deputy Secretary

Mr. D. A. McGeachy
Deputy Treasurer

March 10, 1978

Dear Sir/Madam:

Recently we sent you a questionnaire to help the Edmonton Public School System evaluate its Vocational Education Program.

So far we have not received the completed questionnaire from you. We're writing this letter to remind you and ask again for your help.

We would be very grateful if you could fill out the survey form and mail it in the self-addressed stamped envelope as soon as possible. It is very important that we get the views of all the people in the sample.

Your opinions count. In fact, we can't change the vocational program without knowing what former students think of it.

So please fill out the questionnaire right away.

If you have already completed and mailed the questionnaire, please ignore this letter.

Sincerely,

W.J. Penner, Ph.D.
Director, Evaluation

WJP/ja

APPENDIX D

CODING MANUAL

INDUSTRIAL EDUCATION STUDY

Follow-up Survey CODE MANUAL

March 3/78

Variable and Source	Card Column	Code	Variable Number
Identifier Top right corner of Questionnaire	1-4	Record letter and number Precede with appropriate zero's to complete 4 digit code e.g., P3 = P003 P42 = P042 P116 = P116	V1
(Blank)	5		
School Section A Number 1	6	1 = Jasper Place 2 = M.E. LaZerte 3 = Victoria Composite (Check recorded answer with Identifer "letter") Victoria Composite (J and P) Jasper Place (K and Q) M.E. LaZerte (L and R)	V2
Major A2	7-8	01 = Drafting 02 = Graphic Arts 03 = Commercial Art 04 = Automotives 05 = Aircraft Maintenance 06 = Auto Body 07 = Appliance Servicing 08 = Building Construction 09 = Machine Shop 10 = Welding 11 = Piping 12 = Sheet Metal 13 = Electricity 14 = Electronics 15 = Beauty Culture 16 = Fashions and Furnishings 17 = Food Preparation 18 = Health Services 19 = Performing Arts 20 = TV Crafts 21 = Horticulture 22 = Academic Program 23 = Automotive & Welding 24 = Business Typing 25 = Drafting & Commercial Art 26 = Commercial Art & Building Construction 27 = Drafting & Automotive 28 = Electronics & Beauty Culture 29 = Commercial Arts & Performing Arts 99 = Missing	V3
(Blank)	9		

Variable and Source	Card Column	Code	Variable Number
Section B			
B1	10	B1 to B13, Record the number from 1 to 5	V4
B2	11	9 = Missing	V5
B3	12		V6
B4	13		V7
B5	14		V8
B6	15		V9
B7	16		V10
B8	17		V11
B9	18		V12
B10	19		V13
B11	20		V14
B12	21		V15
B13	22		V16
(Blank)	23		
Present Status C	24	Code only one. If more than one, data cannot be coded and should be placed in 'INQUIRY' file. 1 = Apprentice 2 = Unemployed 3 = Employed full time not apprenticing 4 = Full time student 5 = employed part time 6 = housewife 7 = Part time student/part time worker 9 = Missing	V17
Apprentice Trade Relationship C#1(a)	25	1 = yes 2 = No 8 = Not apprenticing 9 = Missing	V18
Apprentice Trade C#1 (b)	26-27	01 = Bricklayer 02 = Carpenter - Building construction 03 = Floorcovering Mechanic 04 = Glassworker 05 = Lather 06 = Painter and Decorator 07 = Plasterer (Drywall) 08 = Roofer 09 = Tile Setter 10 = Heavy Equipment Operator 11 = Communication Electrician 12 = Electrical Mechanic 13 = Electrician 14 = Power Electrician 15 = Instrument Mechanic 16 = Insulator 17 = Millwright 18 = Agricultural Mechanic 19 = Auto Body Mechanic (Automotives) 20 = Heavy Duty Mechanic 21 = Motor Mechanic	V19

Variable and Source	Card Column	Code	Variable Number
		22 = Partsman 23 = Machinest 24 = Sheet Metal Mechanic 25 = Steel Fabricator 26 = Welder 27 = Plumber 28 = Steamfitter 29 = Gas Fitter 30 = Appliance Serviceman 31 = Baker 32 = Cook 33 = Radio Technician 34 = Refrigerator Mechanic 35 = "Beauty Culture" 36 = "Cabinet Maker" 37 = "Piping" 38 = "Plumber and Fas Fitter" 39 = "Printer" 40 = "Food Preparation" 41 = "Commercial Arts" 98 = Not apprenticing 99 = Missing	
Unemployed, worked C #2 (a)	28	1 = Yes 2 = No 8 = Not employed 9 = Missing	V20
Job Related? C #2 (b)	29	1 = Yes 2 = Moderately Related 3 = Slightly Related 4 = Not at all Related 8 = Not unemployed 9 = Missing	V21
Employed, Job Name C #3 (a)	30-31	Use Occupational Classification Codes (Attached) 98 - Not employed 99 - Missing	V22
Job Related? C #3 (b)	32	1 = Yes 2 = Moderately Related 3 = Slightly Related 4 = Not at all related 8 = Not Employed 9 = Missing	V23
Job Search, First C #3 (c)	33	Record number of months 1 = 1 or less 2 = 2, etc. 7 = 7 or more 8 = Not Employed 9 = Missing	V24
Job Search, Present C #3 (d)	34	Record number of months 1 = 1 or less 2 = 2 7 = 7 or more 8 = Not Employed 9 = Missing	V25

Variable and Source	Card Column	Code	Variable Number
Yearly Income C #3 (e)	35-39	Record dollars, Precede with appropriate zero's to complete 5 digit code e.g., $12,345 = 12345 $ 6,789 = 06789 $ 456 = 00456 99998 = Not Employed 99999 = Missing	V26
Student Status C #4 (a)	40	1 = NAIT 2 = Community College - Beauty College 3 = High School 4 = Agricultural College 5 = Alberta College of Art 6 = U. of A. 7 = Bible College (Covenant) 8 = Not Student 9 = Missing	V27
Community College Name C #4 a (ii)	41	1 = Grant McEwan 2 = Beauty School (Cosmo School of Canada) 3 = Alberta College 8 = Not Community College Student 9 = Missing	V28
High School Name C #4 a (iii)	42	1 = EPSB School 2 = Catholic School, Education 3 = School outside Edmonton but in Alberta 4 = School outside Alberta 8 = Not in High School 9 = Missing	V29
Provincial College Name C #4 a (iv)	43	1 = 2 = 8 = Not in Provincial College 9 = Missing	V30
Present Major C #4 (b)	44-45	Construct uniform codes as responses aggregate (Check with coordinator) 01 = 'Electricity' 02 = 'Art' 03 = 'Design Arts' 04 = 'Pre-Technology' 05 = 'Industrial Heavy Equipment Technology' 06 = 'Academic' 07 = 'Electrical Engineering' 08 = 'Cosmetology' 09 = 'Hairstyling' 10 = 'Tele-communications' 11 = 'Millwork and Carpentry' 12 = 'Commercial Baker' 13 = 'Commercial Cooking II' 14 = 'Civil Engineer - Tech.' 15 = 'Engineering' 16 = 'Automotives' 17 = 'Bible (Christian Education)' 18 = 'Business' 19 = 'Psychometrics' 20 = 'Building Construction' 21 = 'Theology'	V31

Variable and Source	Card Column	Code	Variable Number
		22 - 'Geology' 23 = 'Physics' 24 = 'Electronics Engineering' 25 = 'Electronics' 26 = 'Academic Vocational' 27 = 'Welding' 28 = 'Diploma' 98 = Not Student 99 = Missing	
Major Related? C #4 (c)	46	1 = Yes 2 = Moderately Related 3 = Slightly Related 4 = Not at all related 8 = Not student 9 = Missing	V32
Part Time Job Name C #5 (a)	47-48	Use Occupational Codes (Attached) 98 = Not employed part-time 99 = Missing	V33
Job Related? C#5 (B)	49	1 = Yes 2 = Moderately Related 3 = Slightly Related 4 = Not at all related 8 = Not Student 9 = Missing	V34
Looking for full-time job. C#5 (C)	50	1 = Yes 2 = No 8 = Not employed part-time 9 = Missing	V35
(Blank)	51		
D1 D2 D3 D4 D5	52 53 54 55 56	For D1 to D5 record the appropriate number from 1-5. 9 = Missing	V36 V37 V38 V39 V40
Career Advice D6	57	1 = Friends 2 = Teacher 3 = Parents (other relatives) 4 = Guidance Counsellor 5 = Assistant Principal (Dean) 6 = The Respondent (Myself, I, Me, etc.) 7 = Person in the trade 8 = More than one of the above 9 = Missing	V41
Chosen Career? D7	58	1 = Yes 2 = No 9 = Missing	V42
Career Related? D8	59	1 = Yes 2 = No 3 = Cannot say - No Career	V43

Variable and Source	Card Column	Code	Variable Number
Diploma Plans D9	60	1 = Yes 2 = No 3 = Got it 9 = Missing	V44
Qualify of Life (Happy?) D10	61	1 = Very Happy 2 = Pretty Happy 3 = Not too Happy 9 = Missing	V45
Qualify of life (Satisfying?) D11	62	1 = Completely Satisfying 2 = Pretty Satisfying 3 = Not Very Satisfying 9 = Missing	V46
(Blank)	63		
General - Vocational (Preferred Choice) E1	64	1 = 1E (General) 9 = Missing 2 = 1E (Vocational) 3 = Don't know	V47
Taken general course? E2	65	1 = Yes 9 = Missing 2 = No	V48
E3 E4 E5 E6 E7 E8 E9 E10 E11	66 67 68 69 70 71 72 73 74	E3 to E11, record appropriate number from 1 - 5. 9 = Missing (Yes only) or (Completely Blank) For students who answered "No" (2) to question E2, leave E3 to E11 Blank.	V49 V50 V51 V52 V53 V54 V55 V56 V57
Reason for dropping IE (General) E12	75	Record Main (empasized reason) 1 = Boring, unchallenging, Mickey Mouse, not interesting, already know it, etc. 2 = Don't learn specific skills, doesn't lead to a job, doesn't relate to trade or course. No indepth skill development, etc. 3 = Bad relationship with teacher 4 = 5 = 6 = 7 = 8 = Not sure, don't know 9 = Missing, Blank	V58

Variable and Source	Card Column	Code	Variable Number
Miles from school E13	76-77	Record the number of miles. Precede numbers less than 10 by a zero) 01 = 1 or less than one 02 = 2 10 = 10 98 = 98 or more 99 = missing	V59
(Blank)	78		
(Blank)	79		
Card Number one	80	Record the number 1	V60
Identifier	1-4 (of card number 2)	Re-record this persons identifier number as in V1.	V61
(Blank)	5		
Minutes to school E14	6-8	Record the number of minutes. Precede with appropriate zeros. e.g., 005 = 5 minutes 010 = 10 minutes 999 = Missing	V62
(Blank)	9		
Willing to Transfer E15	10	1 = Yes 2 = No 3 = Don't know 4 = Quit school 9 = Missing	V63
Willing to switch major? E16	11	1 = Yes 2 = No 3 = Don't know 4 = Quit school 9 = Missing	V64
Sex F1	12	1 = Male 2 = Female 9 = Missing	V65
Age F2	13-14	Record age in years. 99 = Missing	V66
Siblings F3	15	Record number of siblings. 0 = None 8 = 8 (or more) 9 = Missing	V67
Marital Status F4	16	1 = Single 2 = Married 3 = Separated 4 = Divorced 5 = Widowed 9 = Missing (Uncodeable)	V68

Variable and Source	Card Column	Code	Variable Number
Father's Occupation F5	17-18	Use Occupational Code (Attached) 99 = Missing	V69
Mother's Occupation	19-20	Use Occupational Code (Attached) 98 = Housewife 99 = Missing	V70
Parents Income F7	21-25	Record Annual income in dollars. Precede 5 digit code with appropriate zeros. e.g., $ 8,945 = 08945 $22,345 = 22345 More than $99,997 = 99997 99998 = Don't know 99999 = Missing	V71
Live at Parents? F8	26	1 = Yes 2 = No 9 = Missing	V72
Location F9	27	1 = Edmonton 2 = St. Albert 3 = Sherwood Park 4 = Other city in Alberta 5 = Rural Alberta (or town) 6 = City outside Alberta 7 = Rural outside Alberta 9 = Missing	V73
Distance from School F10	28	1 = 0-10 miles 2 = 10-50 miles 3 = 50-100 miles 4 = 100-200 miles 5 = over 200 miles 9 = Missing	V74
Immigrant Family? F11 (a)	29	1 = All their lives 2 = Not all their lives 3 = one parent - all their life, the parent immigrated 9 = Missing (record 9 only if parts (a) and (b) are missing	V75
Mother's residence in Canada F11 (b)	30-31	Record Number of Years. Precede numbers less than 10 with a zero, e.g., 08 = 8 years 99 = Missing 98 = not immigrants	V76
Father's Residence in Canada F11 (c)	32-33	Record Number of Years. Precede numbers less than 10 with a zero, e.g., 08 = 8 years 99 = Missing 98 = not immigrants	V77
Another language F12	34	1 = Yes 9 = Missing 2 = No	V78

Variable and Source	Card Column	Code	Variable Number
What language F12	35-36	01 = Ukrainian 02 = French 03 = German 04 = Spanish 05 = Dutch 06 = Chinese 07 = Polish 08 = Danish 09 = Hungarian 10 = Arabic 11 = Green 12 = Two languages indicated or more 98 = No other language 99 = Missing (Record 99 only if "yes" (1) was indicated in column 34, but no other language was specified.	V79
(Blank)	37		
THE NEXT SECTION IS FOR THE J's, K's and L's (goldenrod paper) only.			V80
Reason for non-entrance to 32 Series Section G (goldenrod paper)	38-39	01 = Got full time job 02 = Decided to look for full time work 03 = Switched to the General program 04 = Changed schools, taking 32 there 05 = Entered apprenticeship &/or didn't finish 06 = Enrolled in NAIT or College 07 = Tired of school (drop out) 08 = Marks not good enough 09 = Got married 10 = Maternity leave 11 = Took the 22 series while in Grade 12 12 = Took the 22 series while in Grade 12 and graduated 13 = course wasn't offered at school or the program was cancelled 97 = irrelevant positive 98 = irrelevant negative 99 = missing	V81
Name of Job G1 (a)	40-41	Use Occupational Codes (Attached) 98 = No full time job 99 = Missing	V82
Job Relatedness G1 (b)	42	1 = Yes 2 = Moderately related 3 = Slightly related 4 = Not at all related 8 = No full time job 9 = Missing	V83
Reason for seeking employment G1 (c)	43	1 = Financial Reasons, e.g., "needed money" 2 = Indication that employment could advance skills and training more than continued formal education 3 = Finished school 4 = Work more interesting than school 5 = Got married 6 = Course cancelled 7 = Personal reasons 8 = No full time job 9 = Missing	V84

Variable and Source	Card Column	Code	Variable Number
Reason for seeking Employment G2 (a)	44	1 = Financial Reasons, e.g., "needed money" 2 = Indicated that employment could advance skills and training more than continued formal education 3 = Finished school 4 = Work more interesting than school 5 = Getting married 5 = 6 = 7 = 8 = No full time job 9 = Missing	V85
Presently Enrolled? G3 (a)	45	1 = Yes 2 = No 8 = Did not switch to General 9 = Missing	V86
Why General? G3 (b)	46	1 = To get grade 12 2 = 3 = 4 = 5 = 6 = 7 = 8 = Did not switch 9 = Missing	V87
(Blank)	47		
Marks in Major Subject in First Module - from printout	48-49	Record mark for first semester (usually "A" semester) 98 = 100% (* First two)	V88
(Blank)	50		
Marks in Major Subject for second Module	51-52	Record mark for second semester (usually "B" semester) 98 = 100% (*First Two)	V89
Second Card	80	Record the number "2"	V90